

Environmental Assessment for
Gilbert Unit 3 and Unit 4
East Kentucky Power Cooperative
Spurlock Station
Maysville, Kentucky

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LIST OF ACRONYMS

ACSR	Aluminum Core Steel Reinforced
BACT	Best Available Control Technology
CFB	circulating fluidized bed
CO	carbon monoxide
CO ₂	carbon dioxide
dB	decibel
dBA	A-weighted decibels
EKPC	East Kentucky Power Cooperative
EPA	U.S. Environmental Protection Agency
gpm	gallons per minute
lpm	liters per minute
HAP	Hazardous Air Pollutant
ISCST3	Industrial Source Complex Short Term air quality dispersion model
KAR	Kentucky Administration Regulation
KPDES	Kentucky Pollutant Discharge Elimination System
KV	kilovolt
KW	kilowatt
MCM	1000 cubic millimeters
MGD	million gallons per day
MLD	million liters per day
msl	mean sea level
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NEPP	National Environmental Policy Act
NO _x	nitrogen oxides
PM ₁₀	particulate matter
PSD	Prevention of Significant Deterioration
Psig	per square inch gauge
SO ₂	sulfur dioxide

1.0 INTRODUCTION

1.1 BACKGROUND/OVERVIEW

The Rural Utilities Service is a Federal Government Agency within the U.S. Department of Agriculture. Its purpose is to provide financing assistance in the form of direct loans, loan guarantees, and grants to rural cooperatives and municipalities to construct, upgrade, and expand, rural electrical, telecommunication, water, and wastewater infrastructure. Financing assistance to these cooperatives and municipalities is subject to review pursuant to Rural Utilities Service Environmental Policies and Procedures, 7 Code of Federal Regulations 1794. These policies and procedures have been established to comply with the *National Environmental Policy Act* (NEPA) of 1969 as implemented by the Council on Environmental Quality regulations, 40 Code of Federal Regulations Parts 1500-1508.

East Kentucky Power Cooperative (EKPC) is a wholesale power supplier for 17 rural electric cooperatives in Kentucky. Its board of directors is made up of one director and one alternate director from each of the 17 member cooperatives. It provides wholesale power to its members through approximately 2,600 miles (4,184 kilometers) of transmission lines and approximately 270 electric substations. EKPC has a net electric generating capacity of over 1,800 megawatts (MW) from its four generation stations (Dale Station, 198 MW; Cooper Station, 341 MW; Spurlock Station, 850 MW; and Smith Station, 440 MW). All of its generation stations are coal-fired except for the Smith Station that is gas-fired with fuel oil backup. EKPC also has access to 170 MW of hydro-electric generation from the Southeastern Power Administration.

EKPC has submitted an application to RUS for a loan guarantee to add one nominal 268 MW coal-fired electric generation unit at its Spurlock Station located adjacent to the Ohio River near Maysville, in Mason County, Kentucky (see Figure 1.1-1). This environmental assessment will cover an additional nominal 268-MW unit that EKPC may request Rural Utilities Service financing for in the future. The units would consist of two circulating fluidized bed (CFB) boilers, two turbine-generators, two baghouses, two sulfur dioxide removal systems, two selective non-catalytic reduction units, and two 720-foot (219-meter) stacks. EKPC also proposes to construct a double-circuit 345-kilovolt (kV) transmission line from the Spurlock Station that would cross the Ohio River adjacent to Spurlock Station and inter-tie to an existing 345-kV transmission line in Brown County, Ohio. The length of the line would be approximately 3.5 miles (5.6 kilometers) with a 150-foot (46-meter) wide right-of-way. This transmission line would parallel, on either its west or east side, the existing Kentucky Utilities 138-kv Transmission Line that crosses the Ohio River from Mason County, Kentucky to Brown County, Ohio.

1.2 DESCRIPTION OF EXISTING FACILITY

The Spurlock Station consists of two coal-fired generation units that currently produce up to 850 MW of power. Units 1 and 2 were completed in 1977 and 1981, respectively. The entire property is approximately 2,500 acres (1,011 hectares), including an onsite state-permitted special waste landfill that is approximately 190 acres (77 hectares) (see Figure 1.2-1). Fly ash generated by the combustion of coal is disposed of at the special waste landfill. Coal is transported to the site via barge and railroad.

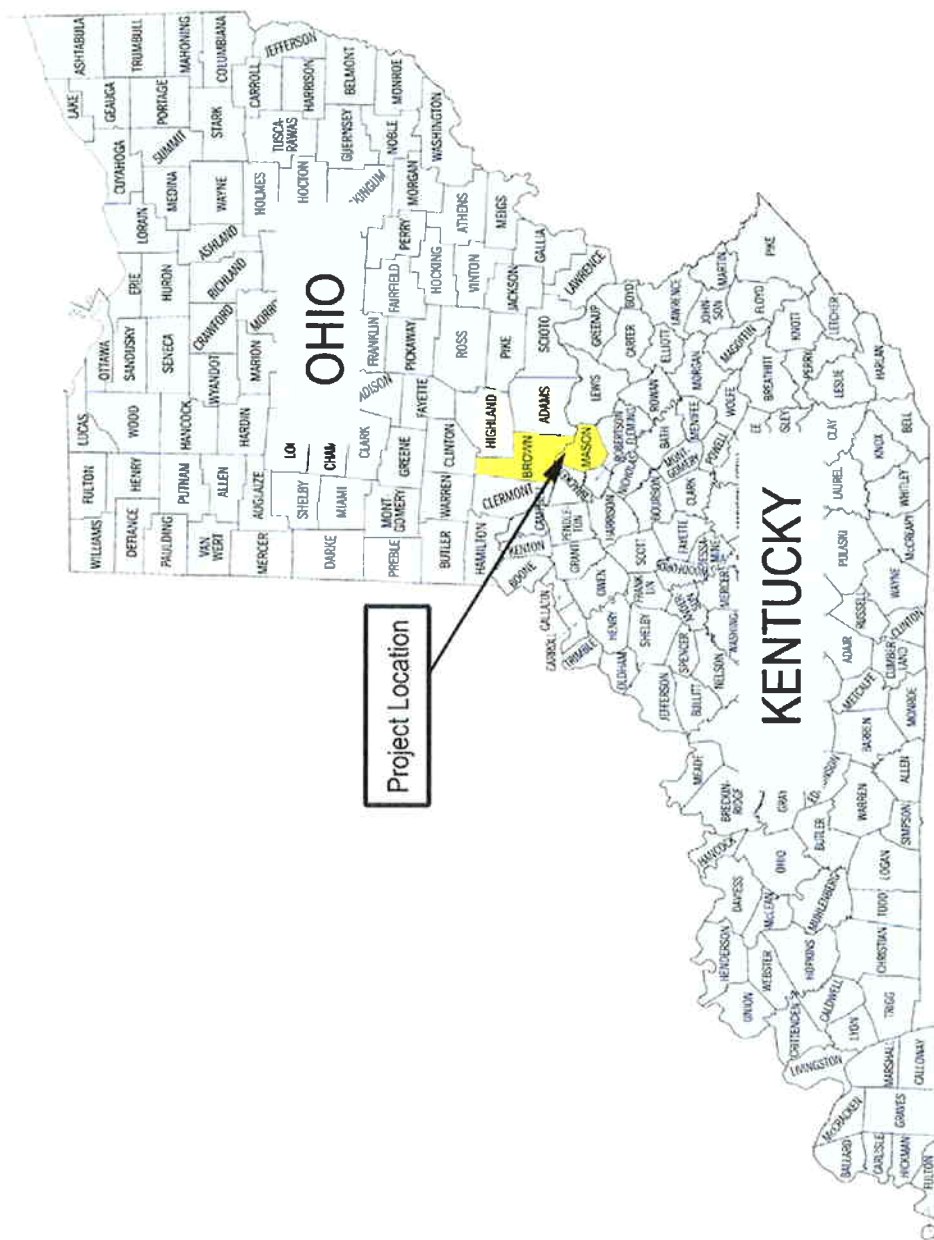


FIGURE 1.1-1.—Location of Project Area.

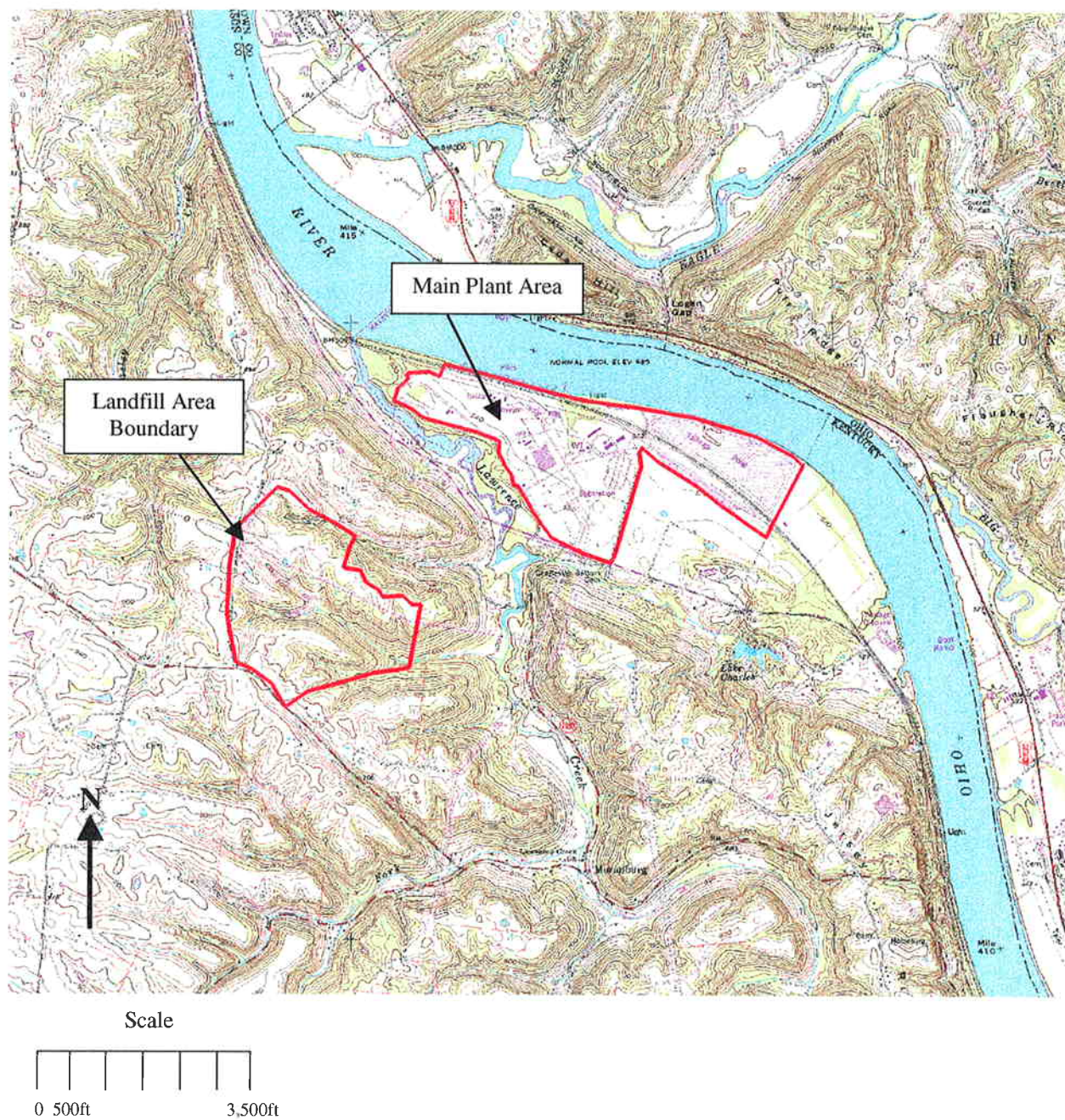


FIGURE 1.2-1.—Spurlock Station Site Layout.

The major features at Spurlock Station is the building housing Units 1 and 2, two 805-foot (245-meter) tall stacks and cooling towers for each unit, coal storage piles (two piles, each containing approximately 200,000 tons [181,436 metric tons] of coal), coal rail and barge unloading and conveyor system, a 50-acre (20-hectare) pond where the bottom ash is disposed of, and two 350,000-gallon (1,324,890-liters) above-ground storage tanks that contain No. 2 fuel oil used for boiler startup. Figure 1.2–2 shows the layout of the main plant area at Spurlock Station and photos of the site are provided in Appendix A.

A more detailed description of the facilities at Spurlock Station is presented in Section 3.10, Infrastructure.

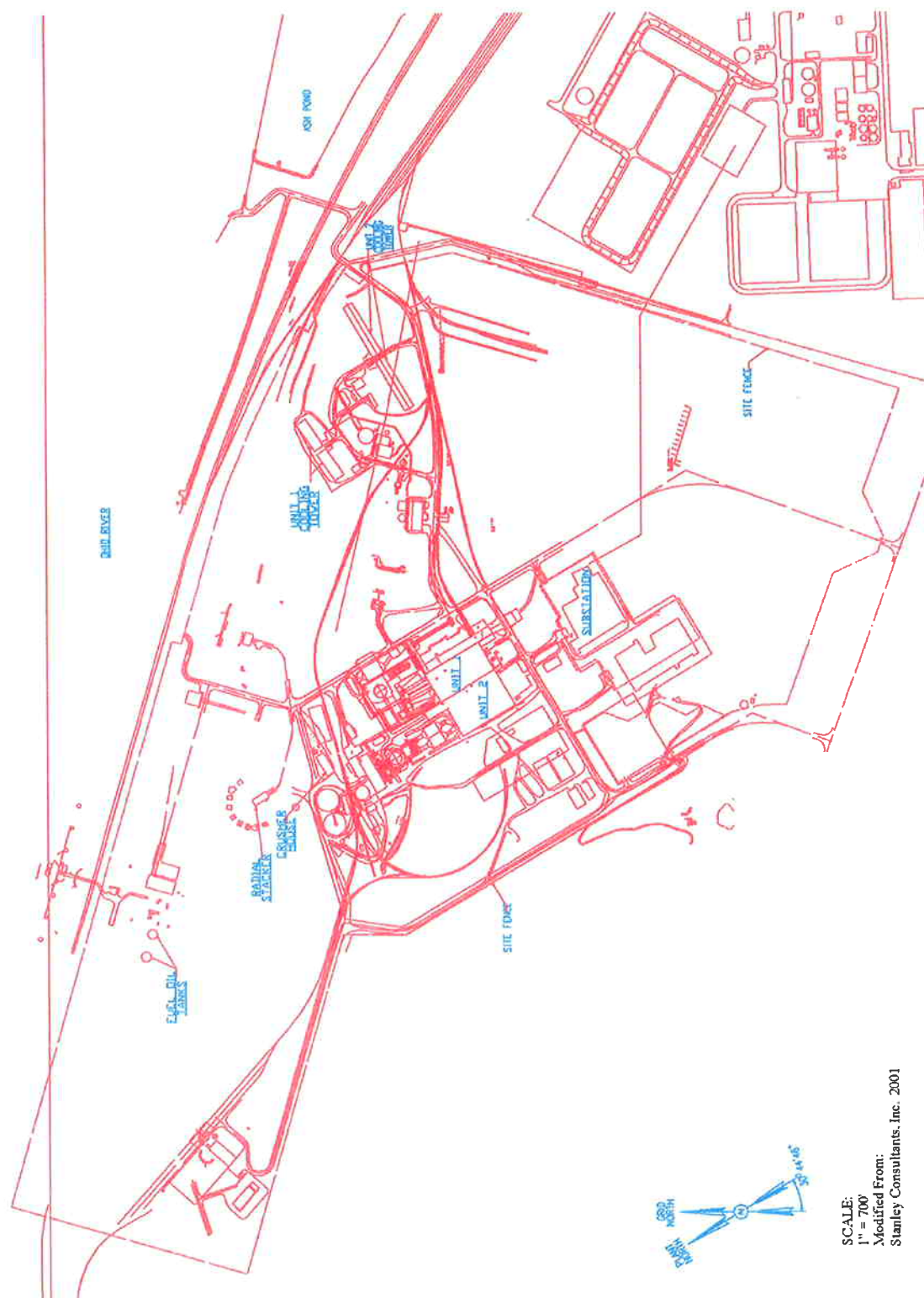


FIGURE 1.2-2.—Main Plant Site Layout.

1.3 PURPOSE AND NEED

Need for Project

The primary need for this project concerns projected shortages of electricity in the project region and the resulting potential impacts to the electrical system reliability. The project area is located within the region covered by the East Central Area Reliability Council. This area includes Kentucky, Ohio, Indiana, Michigan, West Virginia, and parts of Pennsylvania, Maryland, and Virginia. The East Central Area Reliability Council is one of the ten Regional Reliability Councils of the North American Electric Reliability Council.

East Central Area Reliability Council was established in 1967 to augment the reliability of its members' electricity supply systems through coordination of the planning and operation of the members' generation and transmission facilities. East Central Area Reliability Council's membership includes 29 major electricity suppliers located in 9 east-central states serving more than 36 million people.

The East Central Area Reliability Council's Coordination Agreement projections indicate that current capacity plans in the region will not keep up with load growth, therefore, lower reliability in the electric system can be expected in the region. This fact will also support higher prices in the region, given that there is limited supply available to serve the load. East Central Area Reliability Council reports that reserves are at an all time low and units will have to operate more reliably than ever to maintain an acceptable reliability level.

Other factors cited by East Central Area Reliability Council as contributing to lack of confidence in the reliability of the system include aging generating units, increased risk of decreasing availability, reduced maintenance program funding, maintenance scheduling problems, and nitrogen oxide (NO_x) retrofit outages.

EKPC continually evaluates power supply alternatives based on the most recent Power Requirements Study and current cost and financial data. Alternatives for supplying future resource needs are evaluated on a present worth of revenue requirements basis, as well as a cash flow basis. Various alternatives such as self-build options, capacity purchases, and unit participation proposals are evaluated at least once a year and recently have been evaluated on an ongoing basis.

Based on the 2000 Load Forecast, EKPC will require an additional 400 to 500 MW of capacity by the summer of 2006, or within the next 5 years. With the anticipated loss of 150 MW of low cost contract power in that time period, and EKPC's native load growth projections, at least 50 percent of this capacity will need to be provided by a low cost energy resource or a baseload facility.

Purpose of Project

Based on the needs described above, the purposes of EKPC's project include:

- Providing reliable and reasonably priced wholesale power to its 17 system members
- Contributing to the reliability of the regional electrical system
- Limiting air emissions by utilizing CFB technology
- Providing an option to use alternative fuels at Spurlock Station
- Minimizing environmental impacts by using existing infrastructure and brownfield lands at Spurlock Station
- Minimizing impacts of the proposed 345-kV transmission line by running it parallel to an existing transmission line that crosses the Ohio River from Kentucky to Ohio near Spurlock Station

1.4 PURPOSE OF THIS ENVIRONMENTAL ASSESSMENT

The purpose of this environmental assessment is to provide the public with a clear description of the additional electric generation units and associated 345-kV transmission line that are proposed for construction at Spurlock Station and nearby areas, and to assess the related potential environmental impacts. This environmental assessment will be available for public review for 30 days. Rural Utilities Service will take into consideration comments received during the comment period and will factor these comments into its assessment of the environmental impacts associated with the project prior to making its decision related to EKPC request for financing assistance.

2.0 PROPOSED ACTION AND NO ACTION ALTERNATIVE

The Proposed Action considered in this environmental assessment is the construction and operation of the facilities described below.

2.1 PROPOSED FACILITIES

For this project, EKPC proposes to construct and operate the following facilities, described in detail in the following subsections: two electric power generation facilities at their existing Spurlock Station generation facility located near Maysville, Kentucky; and a 345-kV transmission line connecting the new units to the existing Stuart-Zimmer 345-kV line in Brown County, Ohio. Figure 2.1–1 shows the locations of the proposed facilities at Spurlock Station and Figure 2.1–2 shows the location of the proposed transmission line.

Generating Units and Supporting Facilities

The proposed additions to Spurlock Station's generating capacity are two nominal 268 MW coal-powered generator units located adjacent to Unit 2. The units would consist of two CFB boilers, two turbine-generators, two baghouses, two sulfur dioxide removal systems, two selective non-catalytic reduction units, two 720-foot (219-meter) stacks, and associated balance of plant equipment. The balance of plant equipment includes the turbine-generator power cycle equipment. A distributed control system is provided for responsive load changes, reliable operation, and improved thermal performance.

The power generating facility consists of two boilers and two turbines.

Boiler Unit

- Each boiler is a CFB type, designed to deliver 1,922,000 pounds per hour of steam at 2,535 pounds per square inch gauge (psig) and 1,005°F (544°C). The minimum steam flow rate for each boiler is 35 percent of the boiler maximum continuous rating without auxiliary fuel support.
- The boiler and auxiliaries are designed for operation when burning a wide range of specified fuel. Currently, EKPC envisions that coal will be the primary fuel. However, the CFB technology allows for alternative fuels including shredded automobile tires and biomass.
- No. 2 Fuel Oil is used for boiler startup.

Turbine/Generator Unit

- Steam from each boiler is fed to a single-reheat condensing turbine-generator. The turbine is designed for a net output of 310 MW, based on throttle steam conditions of 2,415 psig and 1,000°F (542°C) and condenser exhaust pressure of 2.5 inches of mercury operating at the average annual wet bulb temperature. The continuous turbine-generator unit output is approximately 298 MW gross based on the design fuel.

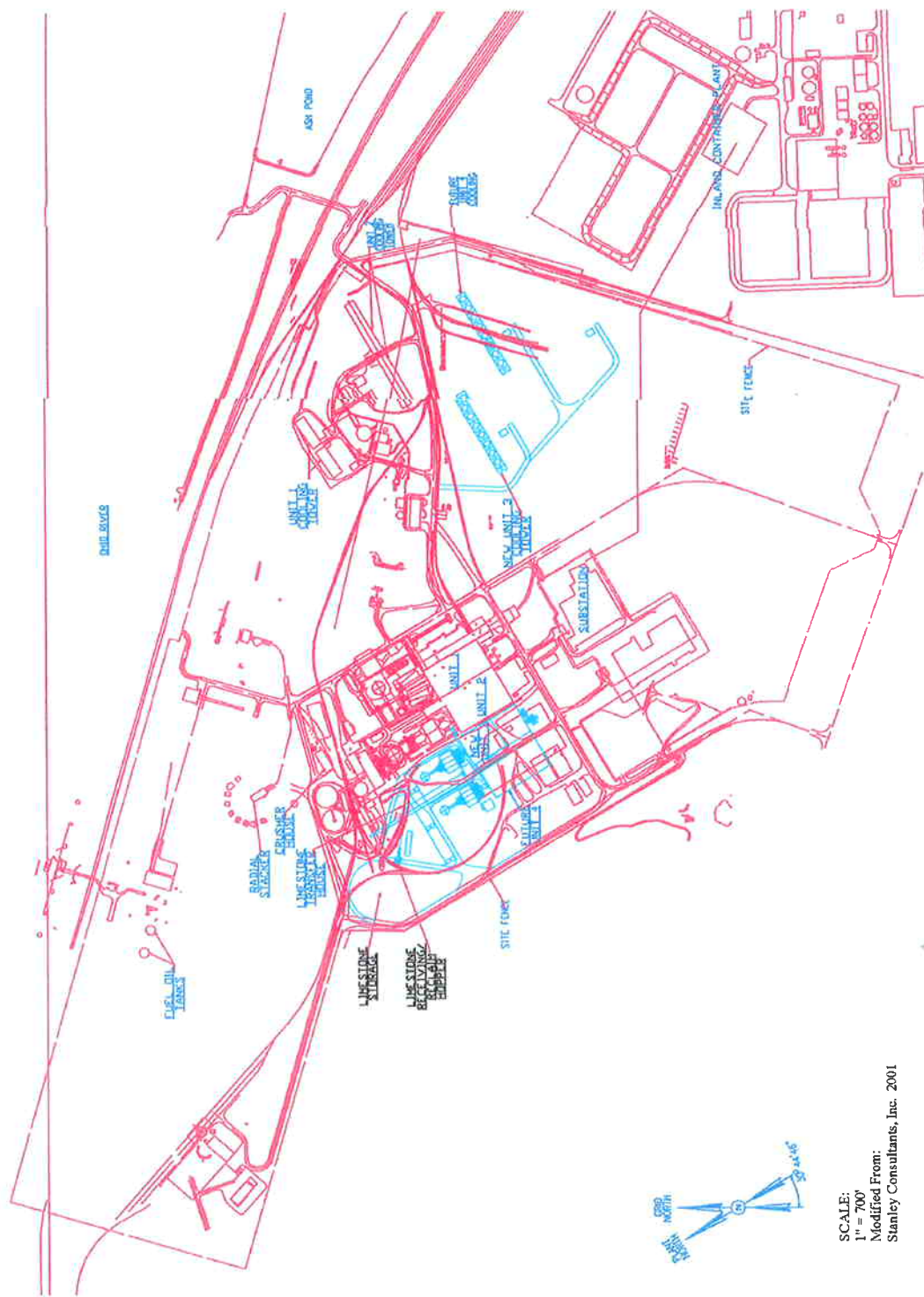


FIGURE 2.1-1.—Location of Proposed Facilities at the Spurlock Station.

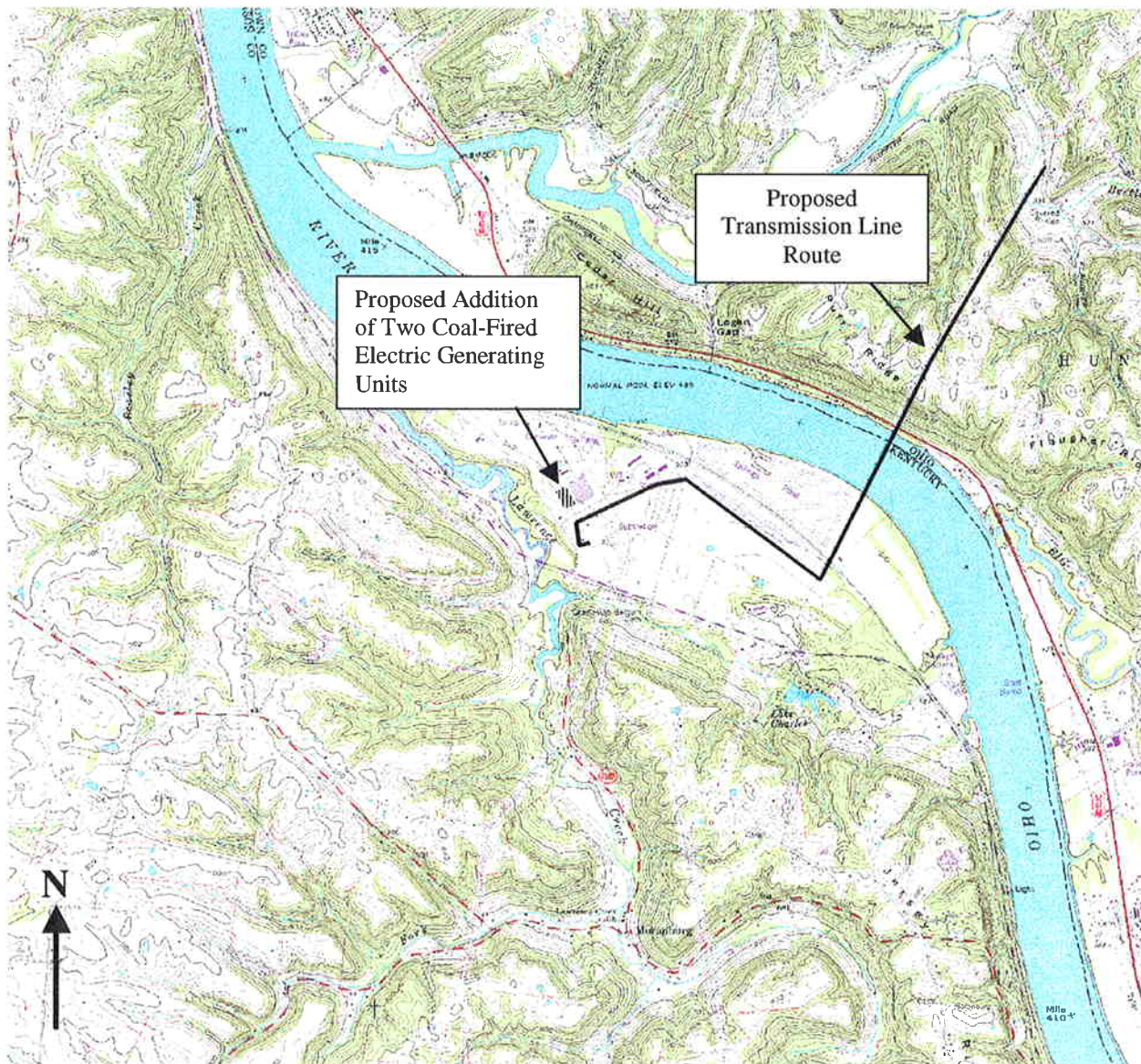


FIGURE 2.1-2.—Location of Proposed Transmission Line.

Facility Design

Each unit, composed of boiler and turbine, is designed to provide 268 MW (net capacity) under the design conditions. The facility is designed to be capable of operating with a high equivalent availability factor and operated for a minimum of 30 years with downtime for periodic inspections and maintenance. Facility electrical output and power factor may vary hourly in response to system loading demands. The facility's electrical output is controlled from 35 percent to 100 percent of net electrical unit capacity. The facility is designed, procured, constructed, checked out, commissioned, and tested in accordance with practices typically applied in other similar electric utility production facilities. Units 3 and 4 together are designed to provide up to 550 MW net electrical output to the local power grid at 0.85 power factor as measured at the high side of the main step up transformer. Units 3 and 4 will be known as Gilbert Unit 3, in honor of the former long-term EKPC Chairman E.A. Gilbert, and Unit 4.

Other Details

The footprint of the two units as designed is approximately 90,000 square feet (8,361 square meters). All facilities will be constructed in the immediate area of the existing plant on land that has been disturbed by activities at the plant. The Spurlock Station has unrestricted access for delivery of large and/or heavy equipment by road, railroad, or barge. The site has adequate soil conditions for equipment and building foundations, available fuel supply, water supply, sewage, and waste treatment, transmission lines, and substation.

As currently planned, the construction of each unit should take 29 months to complete. Construction of Unit 4 should begin approximately 1 year after beginning Gilbert Unit 3. Once construction is complete, a testing phase lasting 3 months will be conducted for each unit.

For Gilbert Unit 3, existing infrastructure will be utilized to the maximum extent possible. The plant will simply increase throughput using the existing infrastructure. The coal unloading and conveying system, water intake structure and piping, and the ash handling system will require only minor modifications. The existing coal storage piles will not be expanded but will be segregated into two piles, one for Units 1 and 2, and one for Units 3 and 4.

For Unit 4, some expansion of the supporting infrastructure will be necessary. An additional coal unloading and conveying system will be required for Unit 4.

Operation and Maintenance

Except for scheduled maintenance operations and equipment breakdowns, Units 3 and 4 would operate 24 hours per day, 365 days per year. The additional units would necessitate the hiring of 25 full-time personnel per unit. Water will be withdrawn from the Ohio River through the existing intake structure (an additional pump would be the only change) and treated at the existing water treatment plant. An additional 5,000 gallons per minute (18,925 liters per minute) clarifier would be installed to provide adequate treatment capacity. Expected water use is 4.32 million gallons per day (MGD) (16,351 cubic meters per day) for each unit at a rate of 3,000 gallons per minute (11,355 liters per minute).

Process wastewater generation is estimated at 1.1 MGD (4,164 cubic meters/day). This waste would be discharged to the Ohio River under Spurlock Station's existing Kentucky Pollutant Discharge Elimination System (KPDES) permit. The existing sanitary wastewater system discharges to the Maysville publicly owned treatment plant, which has capacity for the additional personnel associated with Units 3 and 4.

Maintenance activities for the additional facilities would be similar to those ongoing at Spurlock Station and would be considered routine. Because many of these activities typically generate small quantities of waste products, they are discussed in detail in Section 3.11, Waste Management.

Transmission Line

The project will include the construction of transmission lines radiating out of the facility, along with existing transmission lines, sufficient to carry the electrical output of the facility. The transmission line proposed as part of this project consists of a double-circuit 345-kV line with a conductor size of 2-954 MCM ASCR. Both circuits will be supported by H-frame wood pole and steel lattice transmission line structures. The line will be designed to meet or exceed the requirements of the National Electrical Safety Code. Substation additions are included to connect the proposed transmission line into the current electrical system.

The proposed transmission line will extend an estimated 3.5 miles (5.6 kilometers) from the Spurlock Substation until it meets the existing Kentucky Utilities 138-kV Transmission Line. It will then parallel the 138-kV line on either its west or east side from Mason County, Kentucky, across the Ohio River, and into Brown County, Ohio where it will terminate at the intersection point of the existing Stuart-Zimmer 345-kV Transmission Line. The width of the proposed right-of-way will be 150 feet (46 meters).

2.2 ALTERNATIVES

In this section, the alternatives to supply power that were considered by EKPC and eliminated as feasible sources are described. In considering options for additional power generation facilities, including the location of such facilities, EKPC followed a detailed screening process. This section also provides a brief summary of that process. The full evaluation conducted by EKPC can be found in their *Alternative Evaluation and Site Study for Additional Coal-Fired Baseload Report*, dated August 6, 2001.

In addition, as required by NEPA, the No Action Alternative as it applies to this project is also described.

2.2.1 Alternatives Considered

The primary power generation alternatives considered were combustion turbines for peaking capacity; combined cycle units and pumped storage hydro for intermediate capacity; coal-fired units including an Integrated Gasified Combined Cycle and CFB for baseload capacity; and

renewable resources, including hydropower, biomass, geothermal, wind, and solar; fuel cells; cogeneration; and small and independent power producers.

Peaking Capacity

Peaking units generally run on natural gas or fuel oil, as compared to coal or nuclear fuels used in baseload units. Peaking units are used to follow peak loads and can be turned on or off quickly. Combustion turbines are an example of peaking capacity. EKPC currently has a five-unit combustion turbine facility at the Smith Station.

Intermediate Capacity

Intermediate capacity can be used to follow short-term load fluctuations in a more cost effective manner than committing baseload units for needs not met by peaking capacity. Combined cycle and pumped storage hydro storage are two good examples of intermediate capacity and were initially included as potential alternatives in EKPC's screening study.

Combined cycle units are a combination of combustion turbine peaking capacity with a heat recovery boiler and an additional steam turbine generator. A combined cycle plant is a very flexible alternative for locations with a natural gas supply nearby.

A pumped storage hydro unit utilizes upper and lower reservoirs. Water is released from the upper reservoir to turn a reversible hydraulic turbine generator thus producing electric energy. The water is captured in the lower reservoir, and then pumped back to the upper reservoir with off-peak base load energy. The energy cost is the off-peak baseload cost to pump plus losses. Due to losses, the additional use of coal fired baseload plants for pumping could impact compliance plans for meeting emissions limits due to sulfur dioxide emissions from the coal-fired plants.

A preliminary study by the U.S. Army Corps of Engineers indicated there could be economic benefits for having pumped storage hydro capacity on the EKPC system. Since there is a viable, potential pumped storage hydro site in EKPC's service territory, EKPC contracted with a consultant in 1996 to perform a feasibility study of the potential for development of a pumped storage project. The project would need to be jointly developed by EKPC and another utility due to the project's potential capacity and capital requirements. Based on the consultant's study, the pumped storage project would have a lead time of approximately 10 years.

Additional Base Load Capacity Alternatives

EKPC has extensive experience with coal-fired baseload generating units and EKPC's location near the eastern Kentucky coalfields facilitates the use of high quality, low cost coal. Coal-fired alternatives considered in EKPC's study were an Integrated Gasified Combined Cycle unit, and a nominal 268 MW CFB Boiler at Spurlock Station.

Integrated Gasified Combined Cycle Unit

One baseload alternative considered was an Integrated Gasified Combined Cycle unit, a combined cycle facility that produces synthetic gas from coal as its fuel. An Integrated Gasified Combined Cycle unit has a lower heat rate and lower sulfur dioxide emissions than a coal-fired plant with a scrubber.

Spurlock 3 Circulating Fluidized Bed Boiler

EKPC's best self-build alternative for baseload capacity is construction of a third unit at the Spurlock Station site. EKPC evaluated Spurlock 3 as an alternative in a study conducted in 1997; however, it did not appear to be one of the better economic alternatives at that time for the base expansion plan. It was evaluated as a conventional pulverized coal fired unit in 1997.

Since that time, EKPC has been evaluating alternatives for developing CFB boiler plants. This technology appears to be environmentally and economically superior to conventional pulverized coal plants. Fuel costs would be competitive with other EKPC coal-fired units.

Renewable Resources and Energy Storage Technologies

Renewable energy includes any source that is regenerative or virtually inexhaustible. Thus, sources the Energy Information Administration classifies as renewable are: hydropower, biomass, geothermal, wind, and solar. In the State of Kentucky, all renewable generation is currently from conventional hydroelectric sources.

Hydroelectric Power

Hydroelectric plants are classified as storage, run-of-river, or diversion projects. EKPC considered two specific hydro projects in their study. The timing, cost, and operating data were provided by a developer and EKPC hired a consultant for independent review. Both projects considered were 80-MW run-of-river plants, which could supply approximately 352 and 366 gigawatt-hours, respectfully, of energy annually. The projects were proposed based on one module being fabricated, installed, and then tested for one full year with installation scheduled for late summer of 2002. Upon the first module passing performance and capability testing, release for fabrication of the remaining modules would be initiated. It was envisioned that either project would be composed of five modules of approximately 16 MW each. The possibility of a future sixth module was also evaluated in the study.

Biomass

Biomass energy, the energy contained in plants and organic matter, is one of humanity's earliest sources of energy. According to the Energy Information Administration, the majority of biomass energy is produced from wood and wood wastes (64 percent), followed by municipal solid waste (24 percent), agricultural waste (5 percent), and landfill gases (5 percent). Dedicated energy crops, fast-growing grasses, and trees grown specifically for energy production are also expected to make a significant contribution in the next few years.

EKPC will evaluate any project involving biomass on an individual basis for feasibility and economic merit.

Geothermal Power Production

According to the Energy Information Administration, geothermal energy accounts for 5 percent of all renewable energy consumed in the United States in 1997. Except for a single plant in Nevada and a small amount of production in Hawaii, all domestic geothermal energy is produced in California.

Wind and Solar Power Production

Wind energy consumption is smaller than any of the other renewable energy sources measured by Energy Information Administration. Three wind farms in California produce more than 90 percent of the wind power in the United States. In recent years wind energy facilities have begun to appear in other states such as Texas, Minnesota, Vermont, Hawaii, and Iowa. Of these additional states, Texas had the most capacity with 43 megawatts in 1997.

According to the Wind Energy Resource Atlas of the United States done for the U.S. Department of Energy by Pacific Northwest National Laboratory, areas that are potentially suitable for wind energy applications (wind power class 3 and above) are dispersed throughout much of the United States. Kentucky is considered to have little wind energy potential except for the exposed mountains and ridges of the Appalachians at Pine Mountain (rated 3) in extreme Southeastern Kentucky. Kentucky has no U.S. Department of Energy candidate wind turbine sites. The closest site is in Boone, North Carolina.

Solar energy systems use either solar cells or some form of solar collector to generate electricity, heat homes and buildings, and destroy hazardous contaminants. The most promising areas for solar development are in the southwestern part of the United States. In most cases solar energy systems currently are not economical for grid-interactive applications.

Fuel Cells

To date, fuel cells have not been used extensively. With their relatively recent development and only one major manufacturer worldwide, there are only 160 medium sized (200 kilowatt [kW]) units in use. Smaller units have been tested in the space program and in the automobile industry, but the first unit designed for the residential market was not built until 1998.

Fuel cells are a promising technology for the residential sector, but their current high costs do not favor extensive market penetration. EKPC, however, is presently negotiating to test a 3 kW fuel cell with batteries that take it up to 10 kW. EKPC's Research & Development Process is looking at several applications of fuel cells to rural customers.

Cogeneration

Prospective Qualifying Facilities may request EKPC's avoided capacity and energy costs to evaluate the financial feasibility of either locating within the EKPC system or adding a Qualifying Facility at their existing site within EKPC's service area. These rates and the methodology used to develop them are on file with the Kentucky Public Service Commission. EKPC will continue to provide updated rates for Qualifying Facilities and will incorporate their impacts into the planning process as needed.

Small and Independent Power Production

Small and Independent Power Producers are evaluated similar to the Qualifying Facilities as they are considered on an as available basis. The effects of such facilities are incorporated into EKPC's planning scenarios as they arise.

Summary of Capacity Options

Of the alternatives discussed above, wind power, solar power, and geothermal power were not considered for further evaluation because they are not feasible for the project area, or they are not sufficiently developed technologies to be cost competitive in the near future. The pumped hydro project would need a partner to be feasible, would take 10 years, and would involve a considerable amount of risk. It was therefore not included for further evaluation. The run-of-river hydro projects discussed above were considered for further evaluation. Fuel cell projects are being tested and evaluated by EKPC's Research & Development Process.

The remaining capacity options evaluated to determine the best combination of resources to supply EKPC's future needs were:

- Combustion Turbines
- Combined Cycles
- Fluidized Bed Boiler Unit at Spurlock Station
- Run-of-River Hydro

Screening Analysis

The remaining capacity options or alternatives were further analyzed to come up with feasible financial characteristics, such as (1) capital costs and escalation, (2) fixed operating and maintenance costs and escalation, and (3) variable operating and maintenance costs and escalation.

Next, the fuel costs of the feasible alternatives were researched along with their escalation rates. The environmental characteristics of each technology and unit considered were also carefully studied. Finally, maintenance schedules were researched on the feasible units considered. All of this information was then carefully checked, documented, and entered into a database that also contains the most current information on existing EKPC units. Screening curves were created based on the best options for baseload, intermediate, and peaking capacity.

Requests for Proposals

As an electric cooperative financed by the Rural Utilities Service, EKPC must request proposals from other utilities and entities for power and energy to compare with any self-build options proposed by EKPC. Rural Utilities Service will normally limit financing to self-build options if such options are evaluated as the lowest cost alternatives and they are viable.

EKPC has used the Request for Proposal process since it was first implemented in 1990 to meet EKPC's growing capacity needs. The Request for Proposals issued since 1990 have resulted in the construction of EKPC-owned peaking units and power purchase agreements with utilities and power marketers. The most recent Request for Proposal results were received February 2001 and have shown the current plan to add generation at Spurlock Station is the best alternative.

Site Selection

The purpose of the site selection investigation was to determine the suitability of alternate existing EKPC sites, or new greenfield sites, as possible locations for the installation of new generating units on the EKPC system. EKPC's Cooper Station in Pulaski County, Spurlock Station in Mason County, and Smith Station in Clark County were evaluated, as were five new sites within Estill, Lee, and Breathitt Counties near the Kentucky River. A summary of the conclusions of that investigation is presented below.

- The Spurlock site can easily accommodate two units with minor modifications to the existing facility. The ability to utilize the existing station staffing, clean water, wastewater, coal storage and unloading facilities, ash handling facility, and substation area make this site overwhelmingly the most economical site.
- The Cooper Station site cannot accommodate any additional units without high cost. Although it might be possible to acquire contiguous property, topography would severely restrict additional development. Also, foundation conditions would be very unfavorable.
- Three of the potential new station sites, Sites 1 and 2 in Lee County and Site 5 in Estill County were judged somewhat advantageous for development. However, it is expected that environmental regulatory approvals could not be obtained for these sites in a timely manner. Decisively important considerations for these sites would have to be resolved for final site selection.
- Site 3 might be acceptable if crucial considerations are favorably resolved, but it is inferior to Sites 1, 2, and 5.
- Site 4 is substantially inferior to the other sites, and it has no reasonable prospects for development.

The overall conclusion of the report was that the Spurlock site is by far the best choice for two main reasons: it has room for the new units and has existing infrastructure that can be utilized for the new units. The ability to utilize the existing station staffing, water, wastewater, coal

storage and unloading facilities, ash-handling facility, and substation area make this site overwhelmingly the most economical site. In addition, because of the use of the existing infrastructure, potential environmental impacts can be minimized.

2.2.2 No Action Alternative

The no action alternative is derived from the premise that EKPC would not add Units 3 and 4 to Spurlock Station. Current environmental impacts from operation of the plant would continue without change, except that air emissions would be lessened through operation of the selective catalytic reduction units currently under construction (see Section 4.1). Environmental impacts associated with the construction and operation of Units 3 and 4, as discussed in Chapters 4 and 5 of this assessment, would not occur as anticipated. However, under the no action alternative the opportunity to utilize the existing infrastructure at Spurlock Station would not be realized. Under the Proposed Action, EKPC has the advantage of limiting the two new units and associated facilities to within the existing fenced boundary of Spurlock Station, except for the proposed double circuit electric transmission line that will be needed to connect the output of the units to the transmission grid in Ohio.

The no action alternative would force EKPC to choose another alternative, as discussed earlier in this section, to meet its need for an additional 400 to 500 MW of capacity by the summer of 2006 to provide reliable and reasonably priced wholesale power to its 17 system members and contribute its share to the reliability of the regional electrical system. Any potential environmental impacts associated with this scenario are, however, outside the scope of this environmental assessment.

3.0 AFFECTED ENVIRONMENT

The environment that is potentially affected by the Proposed Action is described in this section.

3.1 AIR QUALITY AND NOISE

This section discusses the existing air quality and noise levels in the vicinity of the proposed project. The discussion includes climate patterns, existing air quality, existing air emission sources, and background information on air quality regulations as applicable to the proposed project.

3.1.1 Climate and Meteorology

The climate in the proposed project area is temperate. Winters are moderately cold and summers are warm and humid, which is characteristic of mid-continent climate. During spring, winter, and late fall, there is considerable variability in the day-to-day weather due to frequent passage of weather fronts and associated high and low pressure centers. Generally, precipitation will accompany the passage of these weather fronts. Often during the summer and early fall, high pressure centers become stationary along the east coast. This produces warm, moist southerly winds that result in afternoon showers. This weather pattern can often persist for several days.

Table 3.1–1 presents the climatological data collected at the Maysville Water Treatment Plant, approximately 1.6 miles (2.5 kilometers) from the proposed project, normalized over a period of 30 years. The data show an average daily temperature of 53.4°F (11.9°C) with average maximum temperatures ranging from 39.3°F (4.06°C) in January to 86.9°F (30.5°C) in July. The average annual precipitation for the period of record is 44.61 inches (113.3 centimeters), with the driest months being February and October. The average annual total snowfall is 6.9 inches (17 centimeters), occurring between November and March. Normally there will be 80 days each year with 0.1 inches (0.3 centimeters) or more of precipitation.

TABLE 3.1–1.—Climate Data for Maysville, Kentucky

Month	Average Daily Maximum Temperature (° F)	Average Daily Temperature (° F)	Average Daily Minimum Temperature (° F)	Average Precipitation (Inches)	Average Total Snowfall (Inches)
January	39.3	29.3	19.3	3.13	2.7
February	43.3	32.3	21.3	3.02	2.7
March	54.6	42.7	30.8	4.20	0.6
April	65.5	52.5	39.6	4.20	0.0
May	75.0	61.9	48.8	4.81	0.0
June	83.4	70.7	58.1	3.49	0.0
July	86.9	74.9	62.9	4.57	0.0
August	85.8	73.7	61.6	4.00	0.0
September	79.8	67.4	54.9	3.18	0.0
October	68.5	55.4	42.4	2.77	0.0
November	55.9	44.9	33.8	3.49	0.4
December	44.3	34.4	24.6	3.75	0.4
Annual Average/Total	65.2	53.4	41.5	44.61	6.9

Source: NRCS 1999.

Figure 3.1–1 depicts a 5-year wind rose from 1988 to 1992 for the Cincinnati/Northern Kentucky surface station, approximately 50 miles (82 kilometers) from the proposed project site. The prevailing or most frequently observed wind direction in the project area is northeast. The persistent winds are the result of a predominant area of high pressure, which remains near the southeastern United States for most of the year. However, when cold fronts move across this area, the wind will shift, often for a short duration. The winter and early spring months typically have the strongest winds.

3.1.2 Air Quality

Air Quality Regulations

The U.S. Environmental Protection Agency (EPA) has established air quality guidelines for several different pollutants, referred to as criteria pollutants, based on the protection of public health and the environment. These air quality guidelines, the National Ambient Air Quality Standards (NAAQS), set limits for ambient (outdoor) levels of the following criteria pollutants: nitrogen oxides (NO_x), carbon monoxide (CO), ozone, sulfur dioxide (SO₂), lead, and inhalable particulate matter (PM₁₀). Table 3.1–2 summarizes the NAAQS for each criteria pollutant. Kentucky Division for Air Quality has adopted the NAAQS for implementation in the state, as established in Kentucky Administration Regulation (KAR) 53:010. The Primary Standards are designed to protect public health, including asthmatics, children, and the elderly, and the Secondary Standards are designed to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and property.

TABLE 3.1–2.—Kentucky State and National Ambient Air Quality Standards (NAAQS)

Pollutant	Averaging Time	Primary Standard ppm / µg/m ³	Secondary Standard ppm / µg/m ³
Nitrogen Dioxide (NO ₂)	Annual	0.05 / 100	0.05 / 100
Particulate Matter (PM ₁₀)	24-Hour	NA / 150	NA / 150
	Annual	NA / 50	NA / 50
Carbon Monoxide (CO)	1-Hour	35 / 40,000	--
	8-Hour	9 / 10,000	--
	Annual	0.03 / 80	--
Sulfur Dioxide (SO ₂)	24-hour	0.14 / 365	--
	3-hour	--	0.5 / 1,300
Ozone (O ₃)	1-Hour	0.12 / 235	0.12 / 235
Lead (Pb)	Calendar Quarter	NA / 1.5	NA / 1.5
Hydrogen Sulfide (H ₂ S) ¹	1-hour	--	0.01/14
	Annual	--	1.00 ppb /0.82
Gaseous Flourides (expressed as HF) ¹	1-month	--	2.00 ppb/1.64
	1-week	1.0/800	3.50 ppb/2.86
	24-hour	--	4.50 ppb/3.68

Source: KDAQ 2001.

NA – Not Applicable.

¹ KDAQ standard only, not included in the NAAQS.

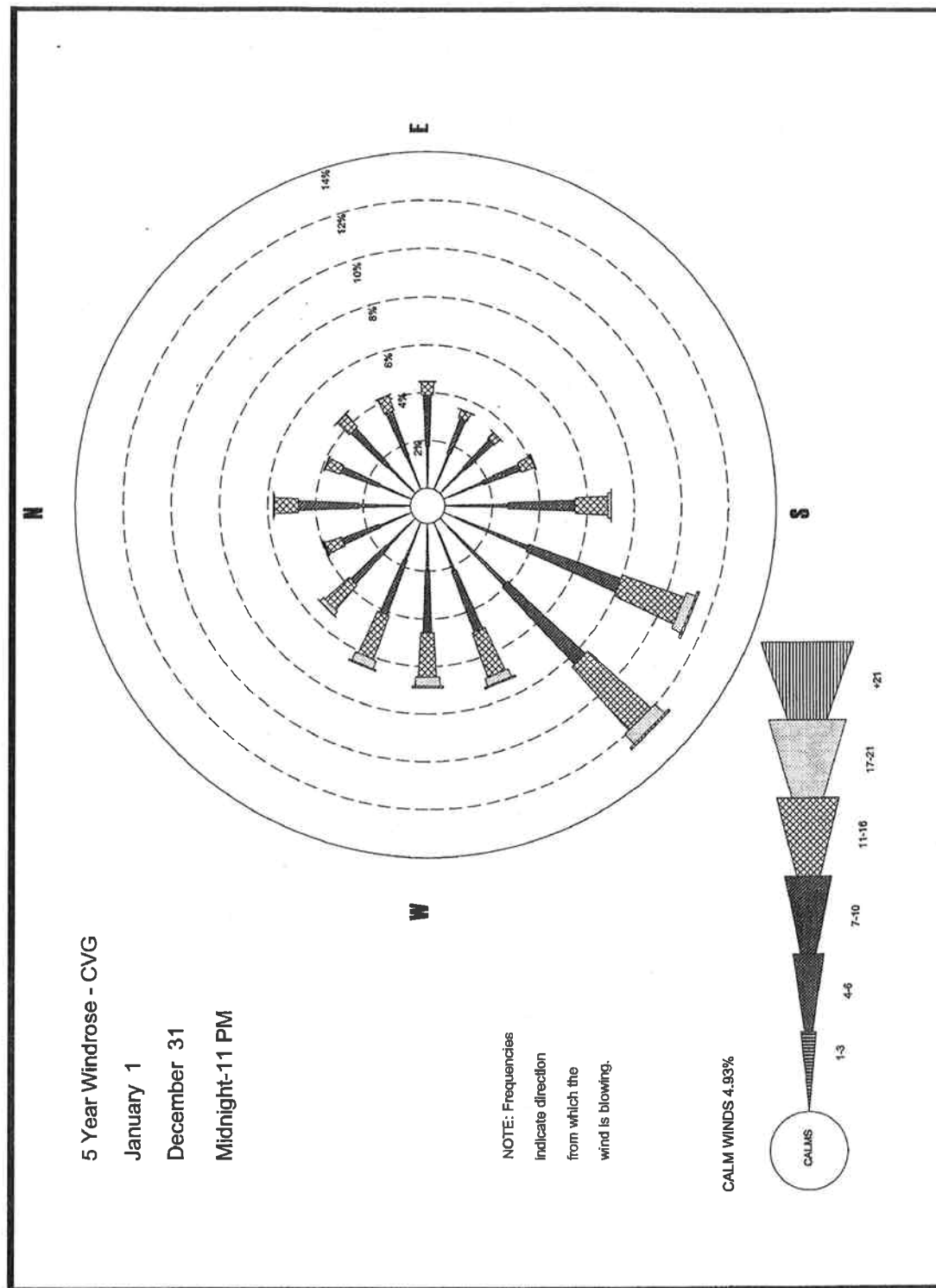


FIGURE 3.1-1.—Five-Year Wind Rose (1998-1992) for Cincinnati/Northern Kentucky.

Based on monitoring the ambient levels of criteria pollutants, EPA evaluates individual Air Quality Control Regions to establish whether or not they meet the NAAQS. Areas that meet the NAAQS are classified as attainment areas, and areas that exceed the NAAQS are classified as non-attainment areas. Air quality records are maintained by Kentucky Division for Air Quality for the purposes of evaluating air quality trends throughout the state. Kentucky has several counties which are designated as non-attainment areas. However, there are no non-attainment areas in Mason County (the location of the proposed project), or in any of the counties in Kentucky or Ohio adjacent to Mason County including Brown County, Ohio, where the proposed transmission line will extend. The nearest non-attainment areas to the proposed project are Louisville, Kentucky (ozone non-attainment area), Chicago and Pittsburgh (PM₁₀ non-attainment areas), and part of Boyd County, Kentucky (SO₂ non-attainment area) located approximately 70 miles (115 kilometers) east of Maysville.

Under the *Clean Air Act*, as amended, major new sources and modifications are evaluated through the New Source Review Program, administered by each state and overseen by EPA. Specifically, in attainment areas such as the proposed project location, a Prevention of Significant Deterioration (PSD) permit is required for the proposed modification. The PSD permit would contain emission limits and other operating, monitoring, record keeping, and reporting requirements based on air quality modeling. The air quality modeling includes emissions from the proposed modification and other sources in the area to ensure protection of the NAAQS and to prevent emission increases beyond a specified amount, called an increment. The emission limits contained in the PSD permit are required to represent the Best Available Control Technology, which is determined on a case-by-case basis, taking into account energy, environmental, and economic impacts and costs. PSD regulations also provide special protection for visibility and other air quality related values in specially designated areas such as National Parks and Wilderness Areas, designated as "Class I" areas. The nearest Class I areas to the proposed project are Mammoth Caves National Park, 150 miles (250 kilometers) southwest of the proposed project, and Great Smoky Mountains National Park, 198 miles (325 kilometers) south of the proposed project.

Similar to the regulation of criteria pollutants under the PSD program, hazardous air pollutants (pollutants known or suspected to cause cancer or other serious health effects) are regulated under Section 112 of the *Clean Air Act*. Section 112 requires new major sources of hazardous air pollutants to have emission limits that represent the Maximum Achievable Control Technology; these levels are based on emissions levels that are already being achieved by the better-controlled and lower-emitting sources in an industry.

Title IV of the *Clean Air Act* establishes EPA's Acid Rain Program. This program aims to achieve significant environmental and public health benefits through reductions in emissions of SO₂ and NO_x, the primary causes of acid rain. Sources subject to this program must comply with restrictions on SO₂ and NO_x emissions.

Existing Air Emissions Sources

Spurlock Station. There are currently two coal-fired utility boilers, Units 1 and 2, at the Spurlock Station. Unit 1 is a pulverized coal-fired, dry bottom wall-fired unit with a maximum

continuous heat input rating of 3,500 mmBTU per hour. An electrostatic precipitator controls emissions of particulate matter from this source, while low-NO_x burners control emissions of NO_x. The Spurlock Station Phase II Acid Rain Permit (A-98-010) places emission limits and monitoring requirements on SO₂ and NO_x from Unit 1. Unit 1 predates the requirement to obtain a PSD permit regulating criteria pollutants from this source.

Unit 2 is a pulverized coal-fired, dry bottom, tangentially fired unit with a maximum continuous heat input rating of 4,850 mmBTU per hour. The boiler is equipped with an electrostatic precipitators for particulate matter emissions control, low-NO_x burners for NO_x control, and a flue gas desulfurization system for SO₂ emissions control. Unit 2 was constructed in 1981 and is subject to emission limits in its PSD permit and the Spurlock Station Phase II Acid Rain Permit. The amount of SO₂ released from Units 1 and 2 is regulated by the permit emission limits rather than by control of the coal type (low or high sulfur) permitted to be used as fuel.

The Spurlock Station also currently contains controlled emission points associated with the coal, limestone, and ash handling and the cooling towers. Table 3.1–3 lists emission rates of SO₂, CO₂, and NO_x from Units 1 and 2 at the Spurlock Station for the year 2000. Emission levels of PM₁₀ and air toxics are not available for the year 2000. The facility's Title V Operating Permit contains limits on the opacity of emissions for each unit.

TABLE 3.1–3.—2000 Emission Levels from Existing Units at the Spurlock Station

	SO ₂ (sulfur dioxide)	CO ₂ (carbon dioxide)	NO _x (nitrogen oxides)
Existing Units 1 & 2	38,652 tons	6,456,631 tons	12,962 tons

Source: EPA 2001.

Other Existing Sources. A number of industrial and power generating facilities are located in Kentucky and Ohio in the vicinity of Maysville, especially along the Ohio River. These facilities are each subject to *Clean Air Act* requirements, implemented by Kentucky Division for Air Quality and Ohio EPA. Table 3.1–4 lists major facilities in the area along with their distance from the Spurlock Station. Included in the list of facilities are a number of coal-fired power plants.

3.1.3 Noise

This section discusses the existing noise levels in the vicinity of the proposed project, and describes the basic measurements used for sound. Noise is a potential environmental issue associated with both construction and operation activities. The description of the existing sound environment requires a general understanding of how sound is measured and its effects on the human environment.

Noise is defined as sound that is undesirable because it interferes with speech, communication, or hearing; is intense enough to damage hearing; or is otherwise annoying. The measurement and human perception of sound involves two basic physical characteristics: intensity and frequency. Intensity is a measure of the sound energy of the vibrations, and frequency is the measure of the tone or pitch of the sound.

TABLE 3.1–4.—Major Facilities in Spurlock Station Region

Facility Name	State	Distance to Spurlock Generation Station (miles)
Inland Paperboard & Pkg.	KY	0.5
Bevins Sand & Gravel Inc.	KY	1.9
Dravo Lime, Inc.	KY	9.4
Vickers Welco	KY	4.9
Riverway Fertilizer Co.	KY	5.4
Standard Supply Co.	KY	5.5
Emerson Power Trans. Corp.	KY	5.6
Aristech Chemical Corporation	KY	53.7
Cincinnati Gas & Electric Co., WM. H. Zimmer	OH	25.9
Cincinnati Gas & Electric Co., Miami Fort Station	OH	60.3
Cincinnati Gas & Electric Co., W.C. Beckjord	OH	33.0
Cincinnati Paperboard	OH	42.7
Dayton Power and Light Co., Stuart Generating Station	OH	8.5
Dayton Power and Light Co., Killen Generating Station	OH	17.9
E.I. Dupont Fort Hill Plant	OH	17.9
GE Aircraft Engines, Evendale Plant	OH	51.0
Hilton Davis Company	OH	28.9
New Boston Coke Corporation	OH	47.2
United States Enrichment Corporation	OH	48.1
ZF Batavia LLC	OH	30.8

Source: Kenvirons 2001.

The physical unit most commonly used to compare the intensity of sounds is the decibel (dB). The higher the energy carried by the sound, the louder the perception of that sound, and thus, the higher the dB rating of the sound. A sound level of just above 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB.

The second important characteristic of sound is its tone or frequency, which is the number of times per second the air vibrates, measured in Hertz (Hz). All sounds in a wide range of frequencies are not heard equally well by the human ear, which is most sensitive to frequencies in the 1,000 to 4,000 Hz range. To account for this variable response of the human ear to different tones, decibels may be adjusted to A-weighted decibels (dBA). The adjusted decibels represent the human hearing response to sound. The maximum sound levels of typical events are shown in Table 3.1–5.

In addition to measuring a single sound event, a time-average sound level can be calculated (also in dBA) to represent the average sound over a specified length of time. For the evaluation of community noise effects, and particularly construction noise effects, the Day-Night Average Sound Level is often used. The Day-Night Average Sound Level averages construction sound levels at a location over a complete 24-hour period, with a 10 dB adjustment added to those noise

events that take place between 10:00 p.m. and 7:00 a.m. This 10 dB “penalty” represents the added intrusiveness of sounds that occur during normal sleeping hours, both because of the increased sensitivity to noise during those hours and because ambient sound levels during nighttime are typically about 10 dB lower than during daytime hours.

It is important to distinguish between the measurement of a single sound event and the calculation of a time-averaged Day-Night Average Sound Level, both of which are often represented in dBA. Because the Day-Night Average Sound Level is a measurement of an average, a Day-Night Average Sound Level of 50 dBA could result from a few noisy events or a large number of quieter events. Day-Night Average Sound Level does not represent the sound level heard at any particular time, but rather represents the total sound exposure.

The U.S. Department of Housing and Urban Development established a Day-Night Average Sound Level standard of 65 dBA for eligibility for federally guaranteed home loans. In 1974, the EPA identified noise levels that could be used to protect public health and welfare including prevention of hearing damage, sleep disturbance, and communication disruption. Outdoor Day-Night Average Sound Level values of 55 dBA or less were identified as desirable to protect against activity interference and hearing loss in residential areas and at educational facilities.

TABLE 3.1–5.—Comparative A-Weighted Sound Levels

Common Outdoor Sound Levels	Sound Level (dBA)	Common Indoor Sound Levels
	110	
Jet flyover at 1000 feet		Rock band
	100	
Gas lawnmower at 3 feet		Inside subway train
	90	
Diesel truck at 50 feet		Food blender at 3 feet Garbage disposal at 3 feet
Noisy urban daytime	80	
		Shouting at 3 feet Vacuum cleaner at 10 feet Normal speech at 3 feet
Gas lawnmower at 100 feet	70	
Commercial area	60	
Heavy traffic at 300 feet		Large business office Dishwasher in next room
	50	
		Small theater, Large conference room (background)
Quiet urban nighttime	45	
		Library (background)
Quiet suburban nighttime	40	
		Bedroom at night Concert hall (background)
Quiet rural nighttime	30	
		Broadcast and recording studio (background)
	10	
	0	Threshold of hearing

Source: Canter 1977.

The two coal-fired boilers and associated equipment would be added adjacent to the existing units on the Spurlock Station property. Typical existing noise levels on the EKPC property line range from approximately 45 dBA near the existing units, to approximately 53 dBA near the landfill. The existing noise level near the landfill is primarily noise generated by ash haul trucks, with an average of 20 trucks per day. Construction of control equipment currently being added for the existing units has resulted in temporarily elevated noise levels of approximately 64 dBA on the EKPC property line nearest the construction activities (EKPC 2001).

Beyond the EKPC property line, and along the proposed transmission line corridor into Brown County, Ohio, the land is primarily rural with scattered residences and two-lane highways. Thus, current noise levels along the transmission line route are predominately low, typically with a Day-Night Average Sound Level near 30 dBA. The Day-Night Average Sound Level may increase to 50 to 68 dBA near industry and major roads along the Ohio River (Canter 1977).

All existing noise levels beyond the Spurlock Station property boundary are below what is normally considered compatible with residential land uses and other noise impact guidelines. The primary sources of noise are: (1) passage of trains several times daily on tracks along the south side of the Ohio River; (2) everyday vehicular traffic along nearby roadways; and (3) operational noise associated with industrial activity. Existing noise derived from construction at the Spurlock Station is generally intermittent and highly variable depending on the time of day.

3.2 GEOLOGY AND SOILS

This section discusses the geologic formation and soil types that underlie the proposed project area on Spurlock Station and the proposed transmission line corridor in Brown County, Ohio.

3.2.1 Geology

The Spurlock Station is located in the Outer Bluegrass Physiographic region, which is characterized by deep valleys with little flat land (Figure 3.2-1). The Outer Bluegrass physiographic region extends 6 miles (9.6 kilometers) into Brown County, Ohio, where the proposed transmission line is to be located (ODNR 1998). It is an Interior Low Plateau and has very steep hillsides with the steeper slopes in the most dissected areas near the major deep drainageways, such as the Ohio River (USDA 1987).

Elevations in the region surrounding the project site generally range from 500 feet (152 meters) above mean sea level (msl) along the Ohio River to 950 feet (289 meters) at the surrounding hilltops. The elevation ranges for the proposed project sites are as follows:

- Units 3 and 4 construction site: 540 to 550 feet (164 to 168 meters) above msl
- Special Waste Landfill (ash landfill): 800 to 900 feet (244 to 274 meters) above msl
- Transmission line route on the Kentucky side: approximately 520 feet (158 meters) above msl
- Transmission line route on the Ohio side: 500 to 933 feet (152 to 284 meters) above msl

Underlying the project site are geologic formations from the Ordovician and the Quaternary Periods (Figure 3.2-2). Rocks of the Ordovician Period, which underlie the ash landfill and the transmission line corridor in Brown County, Ohio, were formed approximately 490 to 435 million years ago. They consist of interbedded limestone, shale and siltstone of the Bull Fork, Grant Lake, Fairview, and Kope Formations and are easily eroded. Table 3.2-1 provides a detailed description of these formations. Open fractures or a zone of such fractures in bedrock have been found to exist in the Grant Lake Limestone formation that underlies a portion of the ash landfill (KGS 1972). Water percolates through the fractures, dissolving the soluble limestone and creating sinkholes or karst features in the topography of the area. A karst feature is located on the western border of the ash landfill. As mandated by the Kentucky Division of Waste Management, a 250-foot (76.2-meter) buffer will be maintained between the karst feature and the ash landfill.

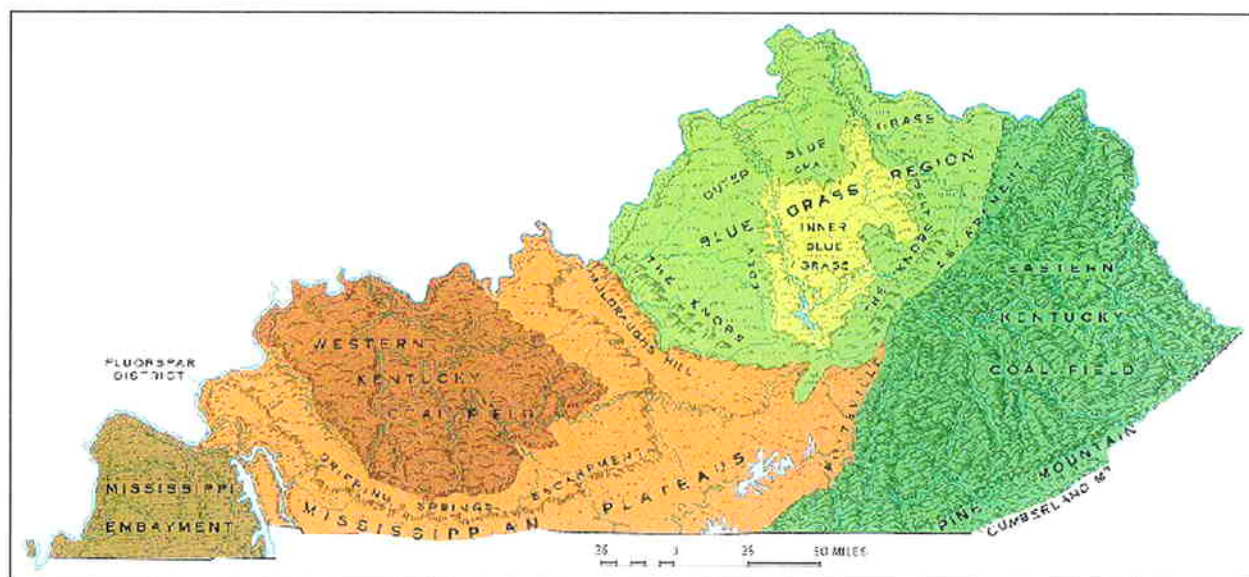


FIGURE 3.2-1.—Physiographic Diagram at Kentucky.

TABLE 3.2-1.—Description of the Geologic Formations Underlying the Proposed Project Site

System (Period)	Series (Epoch) Holocene	Formation and Member	Depth	General Description
<i>Quaternary</i>	Pleistocene and Holocene	Ofm/Ofo: Ohio River flood plain, backwater and low terrace alluvium Ofm: modern alluvium with little or no soil development Ofo: old alluvium with some soil development	0-40 ft (0-12m)	Silt, sand and clay: Beneath flood plain and low terraces, grades from clayey silt downward to sandy silt and fine to medium sand. Silt and sand, light-yellowish-brown to gray, noncalcareous, micaceous, obscurely to well bedded. Contains lenses of vegetable matter, gray silty clay, gravel and detrital coal. Low ridges are sandy; poorly drained swales are clayey. Rest on surface cut on glacial outwash. Thickness generally increases from about 20 to 30 feet beneath higher terrace to 30 to 40 feet beneath modern flood plain. Backwater alluvium consists of obscurely bedded yellowish-brown carbonaceous silt and clay that intertongue with locally derived gravelly alluvium. Soils on modern alluvium show little color, texture or ped development. In areas mapped as modern alluvium, flood couplets of sand and humic mud common. Soils on older alluvium show marked color and texture development and belong to the Wheeling soil cantena.
	Pleistocene	Qe: Eolian deposits: Stippling indicates areas where surface is markedly sandy	0-70 ft (0-21 m)	Silt and sand: Silt, well sorted, poorly to non stratified, weathers light brown to yellowish brown. Sand, light-yellowish-brown, very fine to medium, very well sorted, noncalcareous, generally forms ridges and mounds, locally mantled by silt.
	Pleistocene (<i>Glaciation: Wisconsin</i>)	Qwo: Glacial Outwash	0-130 ft (0-39 m)	Sand, gravel, silt and clay: Sand and gravel, yellowish-brown, well sorted, locally calcareous; show cut and fill structure. Sand, find to coarse, subangular, quartzose, with notable amounts of carbonate (5 percent), chert, feldspar, fragments of various rocks, heavy minerals, and coal grains. Gravel, dominantly pebble size, found mostly in upper and lower 15 feet of unit. Outwash generally leached to depth of more than 25 feet. A mantle of silt 5 to 20 feet thick covers terrace surfaces, ranging from sandy silt on terrace rights to sandy clayey silt in swales.
	Pleistocene (<i>Glaciation: Illinoian and Wisconsin</i>)	Qla: Lacustrine deposits	0-100 ft (0-30 m)	Silt, clay and sand: Silt and clay, light-olive-gray to bluish-gray, commonly calcareous, in alternating silty and clayey beds, laminated in part, locally fossiliferous. Leached at surface and oxidized to light yellowish-brown clayey silt; calcareous concretions at base of leached zone. Near Ohio River interbedded with sand from outwash deltas built into mouths of tributary valleys.

TABLE 3.2-1.—Description of the Geologic Formations Underlying the Proposed Project Site (continued)

System (Period)	Series (Epoch)	Formation and Member	Depth	General Description
Ordovician	Upper Ordovician	Ob: Bull Fork Formation	70+ ft (21+ m)	Limestone and shale, interbedded: Limestone content decreases from about 75 percent near base of unit to about 50 percent in the highest beds preserved. Limestone is medium light gray to medium bluish gray; weathers grayish orange, evenly thing to thick bedded; locally ripple marked. Dominant limestone type composed of medium to coarse fossil fragments in a fine-grained matrix; contains sparse to common argillaceous inclusions. Shale is medium gray, weathers dusky yellow, calcareous; thin bedded fissile; plastic when wet, in partings and sets as much as 12 inches thick. Top of formation not exposed in area.
		Grant Lake Limestone Oglu: Upper member	15-20 ft (4-6 m)	Limestone, rubbly-weathering, mottled medium light gray and light olive gray, thin-bedded, irregularly bedded to nodular; consists of whole fossils and coarse fossil fragments in a very fine to fine-grained argillaceous limestone matrix; contains irregular partings and seams of gray shale. Minor coarse-grained, well sorted limestone locally present.
			30-35 ft (9-10 m)	Limestone and shale interbedded: Limestone (65 percent to 85 percent of unit) is medium light gray to medium bluish gray, fine to coarse grained, fossil fragmental, evenly thin to medium bedded, medium to well sorted.
		Ogli: Lower member	50-60 ft (15-18 m)	Limestone, rubbly-weathering, mottled medium light gray and light olive gray, irregularly thin bedded to nodular; consists of whole and coarsely broken fossils in a fine-grained argillaceous limestone matrix. Gray shale occurs as irregular partings and thin beds. Minor fine- to coarse-grained, medium-sorted limestone in thin even beds, mostly in upper part. Gradational with underlying unit-through a zone of 3 to 10 feet thick.
		Of: Fairview Formation	75-95 ft (23-29 m)	Limestone and shale interbedded: Limestone (about 60 percent) of formation of two main kinds: light-olive gray to light-bluish gray, fine-grained, well-sorted, silty, evenly thin to medium bedded, sparsely fossiliferous limestone; and medium-gray to medium-bluish gray, thin- to medium-bedded, fossil-fragmental limestone consisting of closely packed medium to coarse fossil fragments in finely to coarsely crystalline calcite cement. Shale, olive-gray, fissile, calcareous, as partings and sets as much as 1 foot thick. Light-olive-gray silty limestone in even to contorted thin to thick beds, locally conspicuous in upper part. At base, a ledge-forming bed, 3 to 6 feet thick, of obscurely layered very coarse grained limestone composed chiefly of cemented shells of brachiopod <i>Strophomena</i> .
		Ok: Kope Formation	260-275 ft (79-84 m)	Shale and limestone interbedded: Shale (about 70 percent of unit), medium-gray, weathers light gray to dusky yellow; fissile, calcareous, fossiliferous in part. Limestone, medium-gray, thin to medium-bedded. Coarse-grained fossiliferous limestone dominant; fine-grained, silty, sparsely fossiliferous limestone subordinate. Unit consists of beds 5 to 10 feet thick of closely interbedded shale and limestone in about equal abundance. Some beds very fossiliferous. Poorly exposed; forms moderate slopes commonly strewn with limestone float. Upper contact sharp; lower contact gradational.

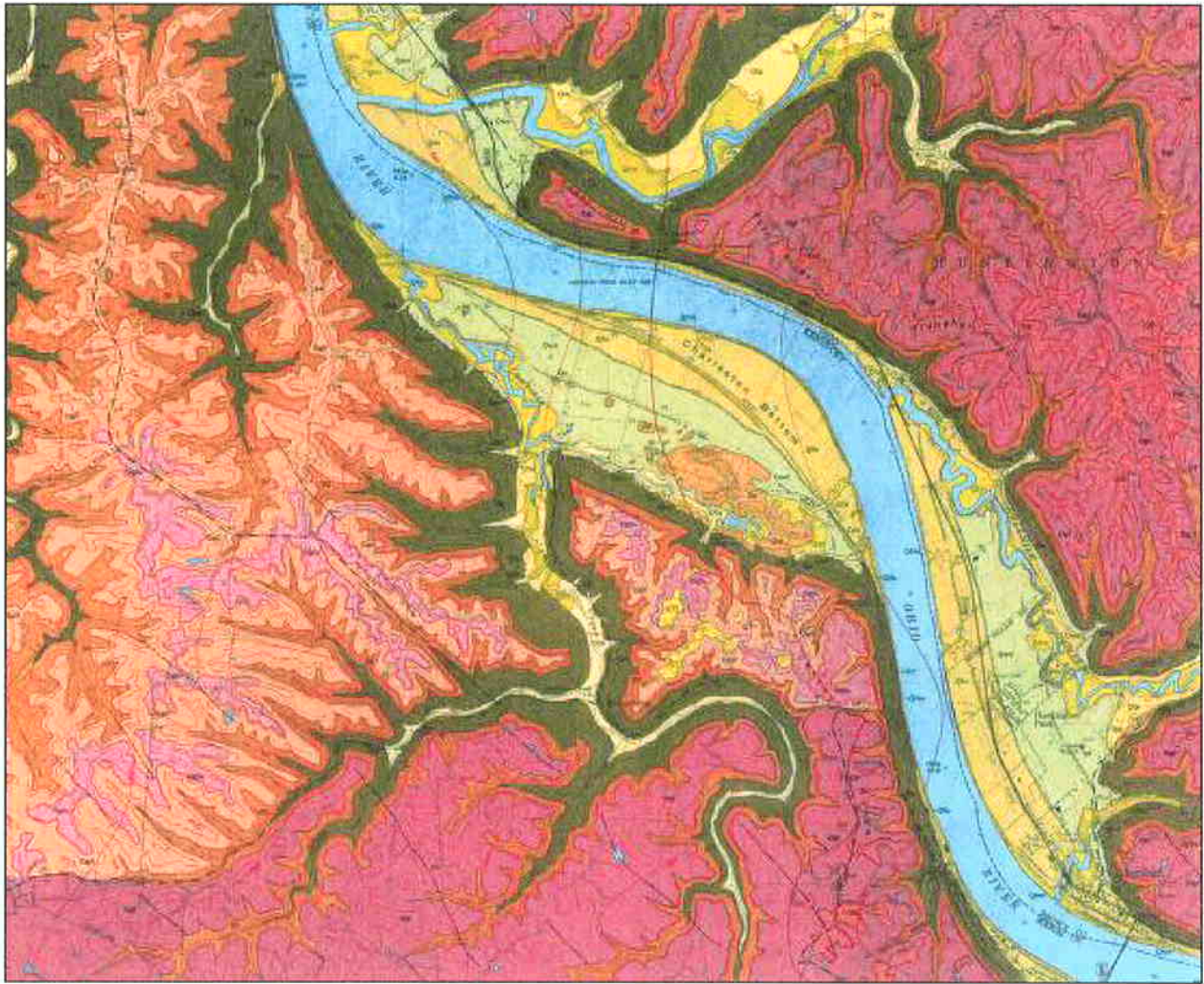


FIGURE 3.2–2.—Geological Map at the USGS Maysville West 7.5-Minute Quadrangle, Kentucky-Ohio.

Formed approximately 1.6 million years ago during the Pleistocene Epoch or Ice Age, the formations of Quaternary Period underlie the generating units and associated facilities of the Spurlock Station. The formations of the Quaternary Period consist of clay, silt, sand and gravel in various combinations that form alluvium, glacial outwash, and eolian (deposited by wind) and lacustrine (lake bottom) deposits that are generally restricted to the floodplains of rivers and creeks. Many varieties of igneous, metamorphic and sedimentary rocks not normally occurring in Kentucky were eroded and deposited in Quaternary Period formations along with wind blown deposits of silt called loess during the last Ice Age.

The Kentucky Geological Service has noted that glacial outwash, on which Units 3 and 4 are to be built, can reach a depth of 130 feet (39.6 kilometers) (KGS 1972). A 1975 Site Evaluation Report for Unit 1 stated that soil boring samples on Spurlock Station indicated that the alluvium depth beneath the site ranges between 113 to 136 feet (34.4 to 41.4 meters) to limestone and shale bedrock (D&M 1975).

3.2.2 Mineral Resources

According to the Kentucky Geological Survey, there are a number of industrial mineral resources such as limestone, clay, shale, sand and gravel, which exist throughout the state (KGS 1972). A number of them have been quarried on or near the Spurlock Station site in the past. Outwash sand with 10 percent gravel has been dug from pits on Spurlock Station in the area known as the Charleston Bottom and was used for general construction purposes (see Figure 3.2-2). Sand and gravel similar to the outwash has also been dredged from the bed of the Ohio River and a gravelly material was dredged from Charleston bar, formerly exposed off the mouth of Lawrence Creek on Spurlock Station. The area is now flooded by a new high pool and an abandoned sand and gravel pit is noted on Figure 3.2-2 on the site (KGS 1972).

The upper 25 feet (7.62 meters) of the Grant Lake Limestone formation is an argillaceous, or clayey, limestone suitable for the manufacture of Portland cement and is manufactured in Springdale, Kentucky, approximately 10 miles (16 kilometers) southeast of Spurlock Station (KGS 1972). Bedrock units in the area furnish construction materials for local use, including fill and unfinished limestone blocks for ripraps and rough masonry. However, none of the limestone in the area is thought to be low enough in insolubles to be used where high chemical purity is a requirement (KGS 1972).

According to the Commonwealth of Kentucky Transportation Cabinet Department of Highways, there are only two active producers of industrial minerals in the area. The Maysville Materials Company produces fine aggregate sand and is located 7 miles (11.2 kilometers) southeast of Spurlock Station. Dravo Lime produces quicklime and has a quarry located approximately 15 miles (24.1 kilometers) southeast of Spurlock Station (KDMDM 2001).

The Kentucky Geological Survey notes that a number of ore minerals, mineral concentrations which are found in veins or in uncommon sedimentary rocks and include calcite, barite, gypsum and various phosphate and iron minerals, exist throughout Kentucky but have not been found on Spurlock Station (KGS 2001).

There are no industrial, ore mineral, or mineral producing plants in Brown County, Ohio (USGS 1999).

3.2.3 Geologic Hazards

The proposed project area is situated on the Cincinnati Arch, a geologically prominent regional uplift in the eastern mid-continent of North America, extending from central Tennessee through central Kentucky to northeastern Ohio (USGS 2001). The most important fault systems in the area are Rough Creek, Kentucky River and Irvine-Paint Creek, all three of which are transacted and perhaps displaced by the north-northeast trending Lexington fault system, which is approximately 35 miles (56.3 kilometer) from the proposed project site (See Figure 3.2–3).

The proposed project area on both the Kentucky and Ohio sides of the Ohio River is located within Seismic Zone 1 (on a scale of 0 to 4, with 4 being the highest risk), the “central stable region” for seismic activity on the North American continent (USGS 2001). Only earthquakes of low to moderate intensity (between 1.6 to 5.2 on the Richter Scale, with less than 2 being no damage to greater than 9 being considerable damage) have been recorded within a 125-mile (201-kilometer) radius of proposed project area, suggesting a risk of moderately damaging earthquakes for the area (ODNR 2000). A search of the National Earthquake Information Center (NEIC) database from 1973 to the present found a July 27, 1980 earthquake of 5.2 on the Richter Scale located 28.7 miles (46.2 kilometers) from Spurlock Station to be the highest magnitude quake within the 125-mile (201-kilometers) radius (USGS 2001a). A search of the same database for a 322.0-mile (518.2-kilometer) radius found a November 30, 1973 earthquake with a magnitude of 5.6 on the Richter Scale located 182.8 miles (294.2 kilometers) from Spurlock Station. A search of Significant United States Earthquakes from 1586 to 1989 for a 125-mile (201-kilometer) radius did not find any earthquakes above 5.2 on the Richter Scale.

The closest active seismic zone to the proposed project area is the New Madrid Seismic Zone (UKY 2001), located approximately 353.0 miles (568.1 kilometers) southwest of Spurlock Station, near Fulton, Kentucky. It is the most seismically active region in the United States east of the Rocky Mountains (UKY 2001). The New Madrid Seismic Zone is located in the central Mississippi Valley with the northern end of the zone marked by the confluence of the Ohio and Mississippi Rivers in southern Illinois. From that point, the zone runs southwest through western Kentucky, through eastern Missouri and western Tennessee and terminates in northeastern Arkansas.

The New Madrid Seismic Zone is made up of a series of strike/slip and dip/slip faults associated the Reelfoot rift, an approximately 44-mile (70.8-kilometer) wide zone, which created these faults. Seismic waves generated from an earthquake in the New Madrid Seismic Zone travel long distances through the series of faults and onto the relatively brittle and flat-lying sedimentary rocks of the Cincinnati Arch region, which tend to carry these waves throughout an area of thousands of square miles for even a moderate-size earthquake (UKY 2001; ODNR 2000).

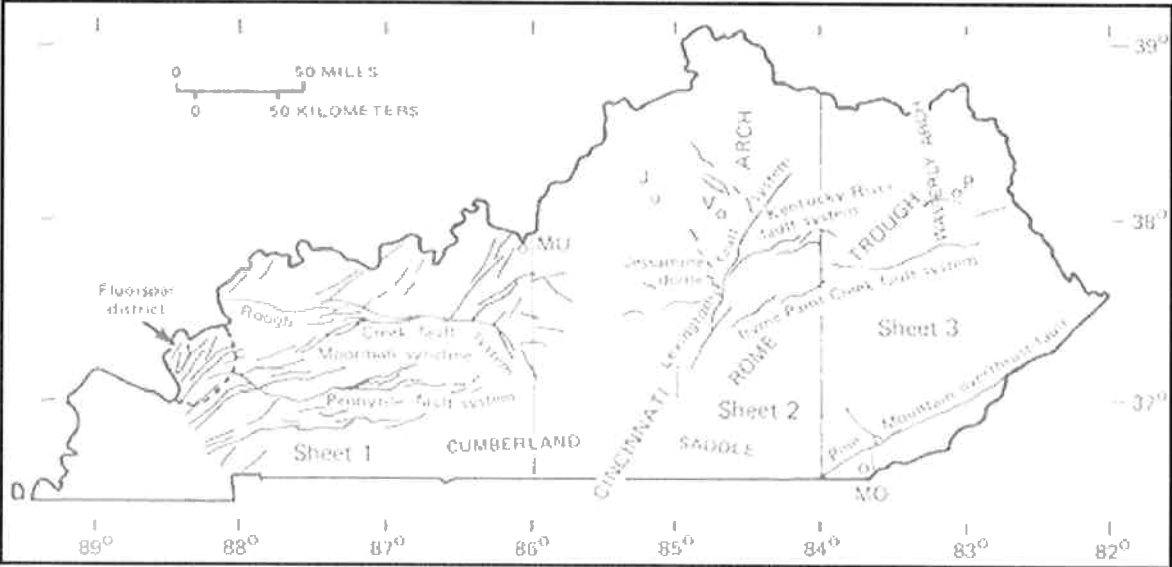


FIGURE 3.2–3.—Fault Systems in Kentucky.

Amongst the largest earthquakes recorded in the United States were the New Madrid earthquakes of 1811-12. At least four separate earthquakes, the largest of which would have registered 8 on the Richter Scale, occurred in New Madrid, Missouri, and were felt as far away as New Hampshire, with minor structure damage noted as far east as Cincinnati, 70 miles (113 kilometers) west of Spurlock Station (UKY 2001). While damaging earthquakes in the New Madrid Seismic Zone have been common throughout recorded history, the reoccurrence interval for the most severe earthquakes is probably every several thousand years (USGS 1987). Only the most severe New Madrid Seismic Zone earthquakes would likely be felt in the proposed project area.

3.2.4 Soils

Facilities – Spurlock Station and Transmission Line (Kentucky side)

Soils within the proposed project site have been mapped by the U.S. Department of Agriculture Natural Resources Conservation Service (USDA 1983) (Figure 3.2-4). It is the Quaternary Period materials that formed the soils that dominate Spurlock Station. These soils are the Wheeling-Nolin-Otwell Association and consist of deep, well-drained and moderately well drained soils ranging from nearly level to steep soils that have a loamy subsoil. Long, wide terraces that break into short side slopes and narrow floodplains typically characterize the landscape. The slopes can range from 0 to 55 percent but are predominantly 0 to 6 percent. Most of the soil on the Spurlock Station has been previously graded for construction. As Table 3.2-2 details, the majority of soils in the Wheeling-Nolin-Otwell Association are generally well suited to construction as permeability is moderate and the shrink-swell potential is low. The soil type WhA dominates the Spurlock site and is the soil type on which Units 3 and 4 are to be constructed (see Figure 3.2-4). The proposed transmission line and 150-foot (46-meter) right-of-way are also to be constructed on the Wheeling-Nolin-Otwell soil series.

TABLE 3.2-2.—Soil Characteristics at the Spurlock Station

Soil Type/Soil Series Name(s)	General Description	Percent Slope	Permeability	Runoff	Shrink-Swell Potential	Erosion Factor*	Depth to Bedrock
Silt loam/Wheeling, Wheeling-Nolin							
WhA	Deep, well drained	0-4%	Moderate	Slow	Low	0.28	> 60 in
WhC	Deep, well drained	6-12%	Moderate	Rapid	Low	0.28	> 60 in
Wn	Deep, well drained	0-2%	Moderate	Rapid	Low	0.28	> 60 in
Fine sandy loam/Chavies							
ChB	Deep, well drained	2-6%	Moderately Rapid	Medium	Low	0.24	> 60 in
ChC	Deep, well drained	6-12%	Moderately Rapid	Medium to Rapid.	Low	0.24	> 60 in
Silt loam/Otwell							
OtB	Deep, moderately well drained	2-6%	Very slow	Medium	Low-Medium	0.43	> 60 in
Silt loam/Nolin							
No	Deep, well drained	Nearly level, occasionally flooded	Moderate	Slow	Low	0.43	> 60 in

* Measure of the susceptibility of a soil to sheet and rill erosion by water used by the NRCS of the USDA (USDS 1983). Values range from 0.02 to 0.69 with the higher value indicating more susceptibility of the soil to erosion. Measurement given in table is an average of two to four samples in succeeding depths to bedrock.

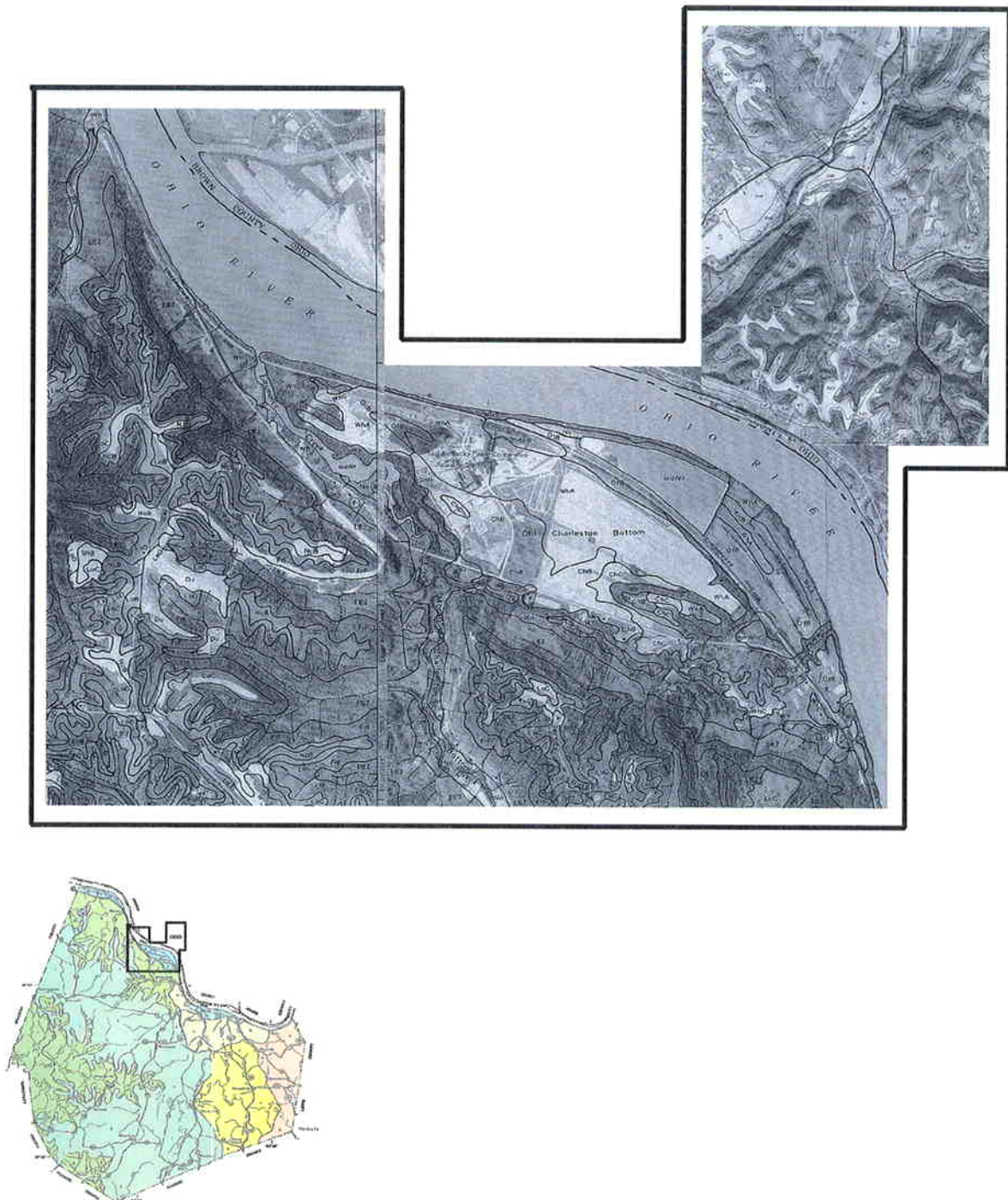


FIGURE 3.2-4.—Soil Classification for the Proposed Project Area in Mason County, Kentucky and Brown County, Ohio.

3.2.4.1 Prime Farmland Soils - Kentucky

According to the U.S. Department of Agriculture Soil Survey of Mason County, Kentucky, the WhA, OtB and No soil types that make up the majority of Spurlock Station are considered Prime Farmland soil types. Prime Farmland soils are best suited to producing food, feed, forage, fiber and oilseed crops and are identified as such to assist in meeting the Nation's short- and long-range needs for food and fiber and to facilitate the wise use of our Nation's Prime Farmland (USDA 1983). However, land that has any contiguous unit of 10 acres (4.05 hectares) or more in size that is used for such purposes as industrial or commercial sites cannot be considered Prime Farmland (USDA 1983). The Spurlock Station consists of approximately 2,500 contiguous acres (1,011.7 hectares) and began operations in 1977. Therefore, by definition, the project site is not considered Prime Farmland. In order to confirm this, EKPC requested that the Natural Resources Conservation office in Maysville, Kentucky conduct a Prime Farmland Determination for the affected area. The Natural Resources Conservation Service determination concluded that since this land area is already developed for non-agricultural purposes, it does not fall into the criteria of farmland use, and therefore, it is exempt from the Prime Farmland designation for environmental evaluation (LeGris 2001).

The only soil in the ash landfill classified as a Prime Farmland soil is the NcB, the Nicolson silt loam (USDA 1983). However, because the ash landfill is an existing permitted landfill, no land in the permitted area is classified as Prime Farmland.

Facilities – Landfill

Much of the soil that dominates the ash landfill has already been classified by the Natural Resources Conservation Service as "Dump" (USDA 1983) (see Figure 3.2–4). The Dump soils encompass the three different cells of the ash landfill, Cells A, B and C. Cell A is approximately 57 acres (23 hectares) and is full. EKPC is currently modifying the ash landfill permit with the Kentucky Division of Waste Management to expand Cell A horizontally and Cells B and C horizontally and vertically so that the entire landfill will ultimately be approximately 190 acres (77 hectares).

The landscape in the landfill area is characterized by broad ridgetops breaking into moderately long and short hillsides. The ash is placed in the valleys between the ridgetops. The soils in the area consist of a number of different types that are detailed in Table 3.2–3. In general, the soils are well drained but have a moderately slow to slow permeability, moderate shrink-swell potential and a shallow depth to bedrock. Because of the poor permeability, stormwater runoff is routed to three sedimentation ponds. Two more sedimentation ponds are proposed in the modified permit request.

TABLE 3.2–3.—Soil Characteristics at the Ash Landfill

Soil Type/Soil Series Name(s)	General Description	Percent Slope	Permeability	Runoff	Shrink-Swell Potential	Erosion Factor*	Depth to Bedrock
Flaggy silt clay loam/Eden							
EfE2	Moderately deep, well drained	20-40%	Slow	Rapid	Moderate	0.23	20-40 in
Rock outcrop complex/Fairmount							
FrF	Shallow, well drained	30-65%	Moderately slow or slow	Rapid	Moderate	0.37	10-20 in
Silt loam/Nicholson							
NcB	Deep, moderately well drained	2-6%	Slow	Medium	Low to Moderate	0.42	> 60 in
Silt loam/Lowell							
LoD	Deep, well drained	12-20%	Moderately slow	Rapid	Low to Moderate	0.31	> 40 in
Dump	NA	NA	NA	NA	NA	NA	NA

* Measure of the susceptibility of a soil to sheet and rill erosion by water used by the NRCS of the USDA (USDA 1983). Values range from 0.02 to 0.69 with the higher value indicating more susceptibility of the soil to erosion. Measurement given in table is an average of two to four samples in succeeding depths to bedrock.

Proposed Transmission Line and 150-foot (46-meter) Right-of-Way (Ohio side)

The soils that dominate the proposed transmission line and 150-foot (46-meter) right-of-way in Brown County, Ohio are from the Eden-Pate-Faywood Association distributed as 35 percent Eden soils, 20 percent Pate soils, 20 percent Faywood soils, and 25 percent soils of minor extent (see Figure 3.2–4). This association, formed on limestone and shale geologic formations, is noted by the Natural Resources Conservation Service as formed of soil material and rock fragments that are unconsolidated, weathered or partly weathered and that disintegrate in place and move down to the base of steep slopes by creep, slide or local wash (USDA 1987). The soils in this association, described in detail in Table 3.2–4, while moderately deep to deep and moderately well drained to well drained, are subject to hillside slippage and are considered unsuited to most kinds of building site development (USDA 1987).

3.2.4.2 Prime Farmland Soils – Ohio

The NRCS only lists two of the soils of minor extent of the Eden-Pate-Faywood soil series as Prime Farmland in Brown County, Ohio: the silt loam Nolin and the silt loam Sciotoville (ScA) (USDA 1987). As Figure 3.2–4 shows, the No soil, located almost 0.5 miles (0.8 kilometers) from the inter-tie to the existing Stuart-Zimmer 345-kV line, will skirt the edge of the 150-foot (46-meter) right-of-way for the proposed transmission line. The silt loam Sciotoville soil, less than an eighth of a mile wide, is located along the Ohio River. To confirm that these two small soil parcels do not constitute Prime Farmland, EKPC contacted the Natural Resources Conservation Service office in Georgetown, Ohio and requested a Prime Farmland Determination for these areas. The Natural Resources Conservation Service concluded that there is a total of 1.06 acres (0.43 hectares) of Prime and Unique Farmland in Brown County, Ohio that would be affected by the proposed transmission line corridor.

Table 3.2-4.—Soil Characteristics for the Proposed Transmission Line and 150-foot (46-meter) Right-of-Way (Ohio side)

Soil Type/Soil Series Name(s)	General Description	Percent Slope	Permeability	Runoff	Shrink-Swell Potential	Erosion Factor*	Depth to Bedrock
Flaggy silt loam/Eden							
EaE	Moderately deep, well drained	25-40%	Slow	Very rapid	Moderate	0.23	20-40 in
EaF	Moderately deep, well drained	40-70%	Slow	Very rapid	Moderate	0.23	20-40 in
Silt loams/Faywood-Lowell							
FeC2	Moderately deep to deep, well drained	8-15%	Moderately slow or slow	Rapid	Low to Moderate	0.32	Faywood: 20-40 in Lowell: > 40 in
Silt loam/Faywood							
FdD2	Moderately deep, well drained	15-25%	Moderately slow to slow	Very rapid	Low to Moderate	0.30	20-40 in
Silty clay/Pate							
PaC2	Deep, moderately well drained	8-15%	Very slow	Rapid	Moderate to high	0.35	> 50 in
PaE2	Deep, well drained	25-35%	Very slow	Very rapid	Moderate to high	0.35	> 50 in
Silt loam,/Nolin							
No	Deep, well drained	Nearly level, occasionally flooded	Moderate	Slow	Low	0.43	> 60 in
Silt loam/Scioto							
ScA	Deep, nearly level, somewhat poorly drained	0-2%	Moderate	Slow	Low	0.37	> 60 in

* Measure of the susceptibility of a soil to sheet and rill erosion by water used by the NRCS of the USDA (USDA 1987). Values range from 0.02 to 0.69 with the higher value indicating more susceptibility of the soil to erosion. Measurement given in table is an average of two to four samples in succeeding depths to bedrock.

3.3 ECOLOGICAL RESOURCES

The terrestrial and aquatic resources present in the proposed project area that could potentially be affected by the proposed project are described in this section. Much of the information presented is summarized from previous environmental studies of the project area (SCI 1975, 1978). Also discussed are wetlands, other environmentally sensitive areas, and threatened and endangered species.

3.3.1 Terrestrial Resources

3.3.1.1 Vegetation

The area around the proposed project area in northern Kentucky and southwestern Ohio is centrally located in the Deciduous Forest Formation of eastern North America. Most of the area was originally a part of the Western Mesophytic Forest, a complex, luxuriant association that covered southwest Ohio, southern Indiana, the southern tip of Illinois, central and western Tennessee, and portions of Kentucky. The Western Mesophytic Forest was comprised of a mosaic of oak-hickory, swamp forest, and mixed mesophytic forest (an association with shared dominance by 25 hardwood species).

Flood Plain Forest. The project area, divided by the Ohio River Valley, includes stands of second growth hardwoods that are scattered throughout the floodplain. These forests include vegetation of variable composition. The most common mature associates are beech mixed with white oak, maple, or elm-ash-buckeye. Several other tree species frequently occur in the bottom land hardwood forest, but do not constitute a dominance. Some of these are: white ash, box-elder, black cherry, American elm, black locust, red maple, sugar maple, silver maple, red mulberry, red elm, hackberry, cottonwood, bitternut hickory, shagbark hickory, red oak, sycamore, black walnut, and black willow. Within the project area, the flood plain forests vary greatly in the number and selection of plants included due to numerous factors such as drainage, soil types, associate species, amount of grazing and time of last timber operation. The flood plain forests are generally found along tributary streams of the area.

Mixed Mesophytic Forest. Adjacent to the river bottoms and making up much of the steeper valley walls are mixed mesophytic forests with plants requiring a basically humid climate with moist, well-drained soils. The mixed mesophytic forests are dominated by broad-leafed deciduous species, but with no single species comprising a very large fraction. Several of the more dominant species include oak, tulip tree, hickory, beech, maple, and some hemlock. The mixture of species in each area depends on such elements as relief, available moisture, and soil type.

Oak-Hickory Forest. The most common forest type in the region is a mixed oak and hickory. This forest type is widespread along ridgetops and invades the flatland prairies and croplands. Various combinations of black oak or scarlet oak, white oak, shagbark hickory, pignut, mockernut, and shellbark make up the dominant species of the forest type. Their associates are maples, black cherry, ash, tulip tree, black walnut, basswood, elm, buckeye, ironwood, and beech.

Shrubs and Vines. Typical shrubs and vines of the region's forests include Virginia creeper, poison-ivy, gooseberry, burning bush or wahoo, black raspberry, spice-bush, elderberry, virgin's bower, greenbrier, bladdernut, grape, and prickly-ash.

Herbaceous Plants. Some typical herbaceous plants of the project area are wild onion, nightshade, crownbeard, scouring rush, snakeroot, manna grass, water leaf, jewelweed, nettle, knotweed, wingstem, and numerous flowers and grasses.

Present Conditions. While most forest associations have been altered by timber harvesting, grazing, and agricultural use within the past 200 years, some isolated remnants occur on the Ohio side of the river. Few such areas occur on the Kentucky side of the river. Within a 20-mile (32-kilometer) radius of the Spurlock Station in Ohio, there are six areas noted for unique vegetation by the Ohio Biological Survey. These are all in Brown County to the northwest of Spurlock Station. The closest is Shot Pouch Run, located approximately 10 miles (16 kilometers) from the station.

3.3.1.2 Wildlife

The most abundant game mammal in the basin is the cottontail rabbit that supports the largest amount of hunting. Bobwhite quail and wild turkey are also abundant and are among the most widely hunted game birds. Most ring-necked pheasant hunting is supported by bird release on managed areas. Wild pheasant populations occur only in limited numbers throughout most of the proposed project area.

Gray squirrels are common in forested sections of the area. Fox squirrels are common in farm wood lots, mixed timber and open lands. Large timbered areas in the proposed project area and surrounding areas support huntable populations of turkey and ruffed grouse.

Woodchuck, gray and red fox, raccoon, muskrat, mink and beaver are also popular hunting or trapping game species. Migratory waterfowl and game birds are also plentiful throughout the area at specific times of the year. White-tailed deer is the only big game species hunted in the project area.

Along with these game species, hundreds of non-game species, small rodents, song birds, reptiles, and insects are important in the area.

3.3.2 Aquatic Resources

Indicator fish species which have shown significant increases in abundance since 1900 in the Ohio River include: Skipjack herring (*Alosa chrysochalcis*), Gizzard shad (*Dorosoma cepedianum*), Goldeye (*Hiodon alosoides*), Goldfish (*Carassius auratus*), Carp (*Cyprinus carpio*), Black bullhead (*Ictalurus melas*), Channel catfish (*Ictalurus punctatus*), Orangespotted sunfish (*Lepomis humilis*). Goldfish and carp are introduced species that came to the area around 1880 and were very successful in finding open niches.

Some representative species showing a significant decrease in abundance since 1900 in the Ohio River include: Ohio Lamprey (*Ichthyomyzon bdellium*), Lake sturgeon (*Acipenser fulvescens*), Shovelnose sturgeon (*Scaphirhynchus platyrhynchus*), Paddlefish (*Polyodon spathula*), Mooneye (*Hiodon tergisus*), Grass pickerel (*Esox americanus vermiculatus*), Muskellunge (*Esox masquinongy ohiensis*), Streamline chub (*Hybopsis dissimilis*), Gravel chub (*Hybopsis x-punctata*), Blue sucker (*Cycleptus elongates*), Harelip sucker (*Lagochila lacera*) - extinct, Spotted sucker (*Minytrema melanops*), Silver redhorse (*Moxostoma anisurus*), Yellow bullhead (*Ictalurus natalis*), Stonecat (*Noturus flavus*), Smallmouth bass, (*Micropterus dolomieu*), Crystal darter (*Ammocrypta asprella*), Mud darter (*Etheostoma asprigene*), Longhead darter (*Percina macrocephala*), River darter (*Percina shumardi*), Walleye (*Stizostedion vitreum vitreum*), and Freshwater drum (*Aplodinotus grunniens*).

The invertebrate communities present in the Ohio River are also undergoing shifts from their historic profiles. Increased siltation is smothering the rock/sand congregations of Hydra, Vorticella, crayfish, caddis and stone fly larvae, dragonfly naiads, and unionid mollusks. Low oxygen-tolerant animals such as the chrionomid larvae are invading in their place. These benthic animals also reflect a generally low biomass due presumably to their constant disruption by barge turbulence. This is echoed down the food chain by a corresponding low biomass of game fishes. The plankton communities are diverse and apparently not adversely affected by the present water turbidity. Diatoms such as Melosira predominate the phytoplankton while the zooplankton is composed mostly of rotifers like Keratella and Brachionus.

No data are available on the aquatic resources of Lawrence Creek.

3.3.3 Wetlands

The only wetland in the project area is a constructed or man-made one located adjacent to Lawrence Creek at the ash landfill. This wetland is approximately 2 acres (0.8 hectares) in size and serves as a final filter for stormwater runoff from the landfill (see Section 3.5, Water Resources).

Vegetation present in this wetland is typical of wetlands in this region, and includes cattails, arrowroot and various sedges.

3.3.4 Environmentally Sensitive Areas

Environmentally sensitive areas are those areas that have not been set aside as wildlife preserves, critical habitat, or other protected areas, but are deemed to have exceptional biological value. Some examples are bird rookeries, areas containing rare plant species, or other areas providing exceptional wildlife habitat.

There are no environmentally sensitive areas within the area potentially affected by the proposed project.

3.3.5 Threatened and Endangered Species

Spurlock Station

Within Mason County, five endangered species can or possibly can occur: one bat (Indiana bat [*Myotis sodalis*]), two mussels (Fanshell [*Cyprogenia stegaria*]), and Clubshell [*Pleurobema clava*]), and two plants (Short's goldenrod [*Solidago shortii*] and Running Buffalo-clover [*Trifolium stoloniferum*]).

Of these listed species, only the Indiana bat may occur at the 2,500-acre (1,011-hectare) Spurlock Station. The closest critical habitat for this species is located in Carter County, Kentucky, approximately 50 miles (80 kilometers) southeast of the station. No known suitable habitat (i.e., roost trees or caves) is present at the areas of the station that will be affected by the proposed project. At the generating units site, no Indiana bats would be expected because of the industrial nature of the operations in the immediate area. Similarly, the unvegetated nature of the ash landfill and its operations make this area unsuitable for the Indiana bat.

Some field investigations have been conducted concerning the as yet undisturbed portions of the ash landfill. As part of the Flue Gas Desulfurization Effluent and Fly Ash Disposal Feasibility Study (1978), field investigations were conducted at the site of the current ash landfill. After the field investigation and confirmation of findings by the Kentucky Department of Fish and Wildlife Resources, it was determined that this area does not support unique habitats. Instead, the habitat was very similar to that found throughout northeast Kentucky and southeast Ohio. The study concluded that while the potential exists for suitable habitat for the Indiana bat, no caves or extensive ledge formations were observed during field investigations of potential disposal sites. Therefore, the presence of the Indiana bat appeared unlikely.

Transmission Line in Brown County, Ohio

Correspondence with the U.S. Fish and Wildlife Service indicates that only the Federally endangered Indiana bat is the only threatened or endangered species known to occur in Brown County, Ohio (Lammers 2001). (See Appendix B for a copy of the letter.) There are no Federal wildlife refuges, wilderness areas, or critical habitat within the vicinity of this project (Lammers 2001).

On October 11, 2001 as part of this environmental assessment, Josh Young and Seth Bishop, Biologists with the Natural Resources and Environmental Communications Department of EKPC, conducted a field survey of the proposed 150-foot (46-meter) right-of-way in Brown County. The area was surveyed for the potential occurrence of the federally endangered Running Buffalo-clover (*Trifolium stoloniferum*), habitat for the endangered Indiana Bat, and other special interest species or habitats. The following is a summary of the survey results.

Ninety-five percent of the proposed corridor is currently being used as cropland, open pasture, or is newly regenerated scrubby forest. Open brushy fields and farmland comprise about 70 percent of the habitat. The majority of the open habitat consisted of fescue (*Festuca arundinacea*) dominated ridge tops. Invasive brushy species such as eastern red cedar (*Juniperus virginiana*),

black locust (*Robinia pseudoacacia*), and *Rubus sp.* characterized the remaining open areas. No federally threatened or endangered species or habitats of special interest were identified with these portions of the proposed corridor.

The remaining five percent of the corridor is comprised of the following plant communities. Dominating the wooded south-facing ridge located just north of the Ohio River and east of the existing Kentucky Utilities 138-kV transmission corridor, were very large older growth trees, most having a diameter at breast height of greater than 20 inches. This habitat can be characterized as a maple/oak/hickory dominated hardwood forest with very little understory and sporadic limestone outcrops. The principal overstory species is red maple (*Acer rubrum*), making up approximately 75 percent of the trees present. Other species encountered in the overstory were chinquapin oak (*Quercus muehlenbergii*), bitternut hickory (*Carya cordiformis*), and Ohio buckeye (*Aesculus glabra*). The understory has very sparse vegetation with the dominant species being Red Bud (*Cercis canadensis*), Pawpaw (*Asimina triloba*), and young trees of the overstory species. During the summer months this habitat may be occupied by the Indiana bat. The Indiana bat, if present, would forage within the area and use trees with exfoliating bark for roost sites.

The western side of the existing Kentucky Utilities line contained a large number of trees that were downed or killed by a landslide. Approximately 20 trees in this area are snags with exfoliating bark that could provide potential roost sites for the Indiana bat. Additionally, the Indiana bat, if present, may use this area for foraging. A copy of the field survey report is available from EKPC Headquarters.

3.4 CULTURAL RESOURCES

Cultural resources are those aspects of the physical environment that relate to human culture and society, and those cultural institutions that hold communities together and link them to their surroundings. Cultural resources include expressions of human culture and history in the physical environment such as prehistoric or historic archaeological sites, buildings, structures, objects, districts, or other places including natural features and biota that are considered to be important to a culture, subculture, or community. Cultural resources also include traditional lifeways and practices, and community values and institutions.

The identification of cultural resources and Federal agency responsibilities with regard to cultural resources are addressed by a number of laws, regulations, executive orders, programmatic agreements and other requirements. The principal Federal law addressing cultural resources is the *National Historic Preservation Act* of 1966, as amended (16 United States Code [USC] Section 470). The implementing regulations, found at 36 Code of Federal Regulations 800, effective January 11, 2001, describe the process for identification and evaluation of historic properties; assessment of the effects of Federal actions on historic properties; and consultation to avoid, reduce, or minimize adverse effects. The term “historic properties” refers to cultural resources that meet specific criteria for eligibility for listing on the National Register of Historic Places. This Section 106 process does not require preservation of historic properties, but does ensure that the decisions of Federal agencies concerning the treatment of these places result from meaningful considerations of cultural and historic values and of the options available to protect the properties.

The identification and evaluation of cultural resources for National Register of Historic Places - eligibility is the responsibility of the Federal agency with the concurrence of the State Historic Preservation Officers. For this project, the appropriate State Historic Preservation Officers (SHPOs) are those from Ohio and Kentucky. The Section 106 process is a parallel requirement, independent of the *National Environmental Policy Act* process, which must be completed prior to constructing the project. The Advisory Council on Historic Preservation, an independent Federal Agency, administers the provisions of Section 106 of the *National Historic Preservation Act* regarding cultural resources and has review and oversight responsibilities defined in 36 Code of Federal Regulations 800.

3.4.1 Spurlock Station Area

Spurlock Station is located north of Highway Route 8, 4.5 miles (7.2 kilometers) southwest of Maysville in Mason County, Kentucky. The project area lies on the northeastern edge of the Outer Bluegrass Region of central Kentucky. Portions of the project area occupy the Ohio River floodplain as well as a low eroded hill overlooking the river valley.

The archaeology of Mason County, Kentucky has been studied by many dating back to as early as 1824. Mason County contains cultural evidence of prehistoric, protohistoric, and historic significance. The exact number of archaeological site types (prehistoric, protohistoric, and historic) and site locations in Mason County are not known. Mason County was one of the richest counties in Kentucky for prehistoric occupation (Funkhouser and Webb 1932). The

entire region is thickly covered with mounds, cemeteries, and village sites and some of these localities have yielded the largest numbers and finest artifacts that have ever been found in the Mississippi Valley (Carstens and Jenings 1978). The most numerous of all archaeological sites in Mason County are from the Woodland Period (1000 BC to 900 AD). Cultural artifacts from this period include rounded- or conically-shaped burial mounds. Several mounds on or around Lawrence Creek and one mound on Beasley Creek were reported (Funkhouser and Webb 1932).

The surface area of the proposed project area has been disturbed by prior site development. Prior to September 2001, no cultural resource surveys have been conducted at the Spurlock Station site. However, because of the potential for buried archaeological resources to occur below the previously disturbed zone, and since no archaeological investigations were conducted prior to the initial construction of the Spurlock Station, the SHPO recommended deep backhoe testing of the Gilbert Unit 3 footprint to determine if buried archaeological sites eligible for listing in the National Registry of Historic Places were present. A Phase I investigation was conducted in September 2001. Three backhoe trenches were excavated at the proposed plant site to the undisturbed area underlying the previously disturbed ground surface. Trenches were excavated to a minimum depth of 8 ft (2.4 m). The Phase I investigation found that surface soils had been previously disturbed to a depth of 2 to 3 ft (0.6 to 1 m). No evidence of buried cultural resources was found in the excavated areas (Gray & Pape, Inc. 2001). The Kentucky SHPO concurs with this finding. (See letter of concurrence in Appendix B). A copy of the Phase I report is available from EKPC Headquarters.

Archaeological surveys have been conducted in and around Spurlock Station in Beasley Creek Hollow which is located about 0.5 miles (0.8 kilometers) west of the Spurlock Station site and in the area around the ash landfill. An archaeological surface reconnaissance of Beasley Creek Hollow, was conducted by Carstens and Jenings in 1977. Beasley Creek is believed to have been an ideal location for prehistoric settlement due to its past climatic conditions and favorable environment.

Carstens and Jenings' archaeological survey of Beasley Creek found 12 prehistoric, 1 protohistoric (cemetery site) and no historic sites above the 860-foot (262-meter) contour adjacent to Beasley Creek. Three historic sites were located at elevations lower than the 860-foot (262-meter) contour. Two of the three historic sites were being dismantled (a 20th century barn and a late 19th century log cabin with barn). The late 19th century log cabin with barn and/or tool shed foundations was being reconstructed elsewhere in Mason County. The third site was a crude limestone retaining wall within Beasley Hollow, believed to have been erected to prevent mudslides.

Consultations have not yet been conducted with the Kentucky SHPO to determine whether additional identification efforts (such as further backhoe testing) would be needed for the areas where Unit 4 and other supporting facilities at Spurlock Station would be sited. This determination will be made and followed through, as appropriate, prior to the construction of Unit 4. Because of the surface site disturbance and current land use, no other kinds of identification efforts (such as Native American consultations on traditional cultural use, or historical building surveys) are expected to be warranted for the Spurlock Station site.

3.4.2 Transmission Line

A new 345-kV transmission line is proposed to connect Units 3 and 4 at Spurlock Station in Kentucky, to the Stuart-Zimmer 345-kV Line in Brown County, Ohio. The centerline of the proposed transmission line, which would cross the Ohio River, has not yet been finalized and the cultural resource identification and consultation process is in its early stages for the transmission line portion of the project.

Prior to beginning clearing or construction activities on the proposed transmission line, consultation will be conducted with the SHPOs of Kentucky and Ohio to determine the scope of the cultural resource identification efforts for the transmission line portion of the project, define the area of potential effect, and identify any parties that should be consulted regarding this undertaking. The appropriate identification effort for this undertaking would likely include archival research to determine past land uses and settlement, review of relevant archaeological and historical studies, consultation with Native American or other groups with traditional ties to the area, and pedestrian archaeological survey of lands that would be directly disturbed by construction and maintenance of the proposed transmission line. The timing of the identification effort and evaluation of any resources for NRHP eligibility or significance to a Native American group can be phased in agreement with the SHPOs.

The proposed transmission line into Brown County, Ohio would traverse land that has similar past environmental conditions to those described for the Spurlock Station site. This dynamic riverine environment provided an array of resources that supported extensive prehistoric settlement. Likewise these resources were attractive to later EuroAmerican settlers and traders. It is possible that cultural resources requiring evaluation and effect determinations are present in the proposed transmission line corridor.

3.5 WATER RESOURCES

In this section, the water resources potentially affected by the proposed project are discussed. Both surface water and groundwater are used for Units 1 and 2 at the Spurlock Station. The primary water source for those units is groundwater. The primary water source for the proposed Units 3 and 4 will be surface water.

3.5.1 Surface Water

Spurlock Station is located on the floodplain of the Ohio River at the U.S. Geologic Survey 414 mile mark. The site has river frontage from approximately U.S. Geologic Survey 414.7 to 412.7 mile mark. Lawrence Creek is located on the Spurlock Station site at approximately the U.S. Geologic Survey 415.3 mile mark. The river valley extends in a general southeast to northwest direction and the floodplain areas are primarily open terrain. Surface runoff drainage for the Spurlock Station plant area is to the Ohio River, while that from the ash landfill is to Lawrence Creek, which then drains into the Ohio River. In Brown County, Ohio, two perennial surface water bodies are located near the proposed transmission line corridor. They are Beetle Creek, which the proposed transmission line corridor would cross, and Eagle Creek, about 0.75 miles (1.2 kilometers) west of the proposed transmission line corridor.

Elevations on the Spurlock Station site range from 500 to 550 feet (152 to 168 meters) above msl. According to the U.S. Army Corps of Engineers' floodplain designation maps, the 100-year floodplain reaches an elevation of 514 feet (156 meters) above msl and the 500-year floodplain reaches an elevation of 520.5 (158 meters) above msl on both the Kentucky and Ohio sides of the Ohio River. The ash pond is located within both the 100-year and 500-year floodplain with the 500-year floodplain extending to just beyond the railroad tracks to the south.

According to the Ohio Department of Natural Resources, the 100-year floodplain in Brown County, Ohio without the floodway reaches an elevation of 514.8 feet (156.9 meters). The floodway adds additional width to the floodplain because it includes the stream channel and adjacent floodplain area that is required to pass the 100-year flood without unduly increasing flood heights. This is the hazardous portion of the floodplain where the fastest flow of water occurs. With the floodway included, the 100-year floodplain in Brown County is 515.6 feet (157.1 meters) above msl (ODNR 2001).

According to the Kentucky Geologic Survey, the average 2-year flood of the Ohio River reaches an elevation of 502 feet (153 meters) above msl at Maysville, which is 4.5 miles (7.2 kilometers) southeast of the Spurlock Station. The 502-foot (153-meter) flood level is considered the upper local limit of the modern floodplain, although less frequent floods may cover lower terraces and deposit or erode a thin layer of mud. The highest recorded flood in the area occurred in 1937 before the construction of the downstream Meldahl Lock and reached about 527 feet (160 meters) at Maysville (KDS 1972).

The flow of the Ohio River past Spurlock Station is now controlled by two locks: the upstream Greenup Locks and Dam on the U.S. Geologic Survey 341 mile mark of the Ohio River operational in 1963 and the downstream Meldahl Locks and Dam on the U.S. Geologic Survey

436 mile mark operational in 1964. The minimum 7-day 10-year low-flow between the Greenup and Meldahl is 6.3 billion gallons per day (25.9 billion liters per day) (ORSANCO 2000). The two dams control the flow of the Ohio River and keep the normal pool of the Ohio River at about 485 feet (148 meters) above msl (SCI 2001). The minimum 7-day 10-year low-flow at the Spurlock Station is 6.3 billion gallons per day (23.9 billion liters per day) (KY NREPC 2000).

The Spurlock Station has an intake structure on the Ohio River that currently withdraws 3.5 million gallons per day (MGD) (13.2 million liters per day [MLD]) for the operation of Units 1 and 2. The intake structure was constructed in 1992 to supplement the use of groundwater for the units.

Surface Water Quality

The State of Kentucky designates surface waters as having one or more specific legitimate uses. These uses are: Warm Water Aquatic Habitat; Cold Water Aquatic Habitat, Primary Contact Recreation; Secondary Contact Recreation; Domestic Water Supply; and Outstanding State Resource Water (401 KAR 5:026). The Ohio River in the vicinity of the Spurlock Station is designated as Warm Water Aquatic Habitat and Primary/Secondary Contact Recreation (KY NREPC 2000). In order to maintain the river's specific use designation, the river must meet certain physical, chemical, and biological water quality characteristics. Near the project site, there are several municipal and industrial sources that discharge treated wastewater to the Ohio River. All wastewater sources must comply with the KPDES permits to assist in maintaining the water quality standards and designation.

Pursuant to Section 303(d) of the *Clean Water Act*, the State of Kentucky has developed a list of waterbodies presently not supporting designated uses based on the monitoring and data collected by the Ohio River Valley Water Sanitation Commission (ORSANCO 2000). Ohio River Valley Water Sanitation Commission was established in 1948 to control and abate pollution in the Ohio River Basin and has an interstate commission representing eight states (Illinois, Indiana, Kentucky, New York, Ohio, Pennsylvania, Virginia, and West Virginia) and the Federal Government. Ohio River Valley Water Sanitation Commission operates programs to improve water quality in the Ohio River and its tributaries, including setting waste water discharge standards; performing biological assessments; monitoring for the chemical and physical properties of the waterways; and conducting special surveys and studies.

Ohio River Valley Water Sanitation Commission monitoring indicated impairments on all Ohio River segments for fish consumption, aquatic life, or contact recreation. For these reasons, all Ohio River segments are included in the 303(d) *Clean Water Act* list (KDNR 1998). The entire length of the Ohio River bordering Kentucky is listed as partially supporting fish consumption use due to a limited fish consumption advisory. Fish tissue levels of polychlorinated biphenyls and chlordane are too high for unrestricted fish consumption. However, recent Ohio River Valley Water Sanitation Commission fish tissue sampling has shown a downward trend in polychlorinated biphenyls and chlordane concentrations in Ohio River fish. A review of the Spurlock Station KPDES permit by the Kentucky Division of Water in June 2000 indicated that no discharges from the station contained polychlorinated biphenyls or chlordane, but both the Ohio River and Lawrence Creek remain designated as Water Quality Limited.

3.5.2 Groundwater

The alluvium and glacial outwash on which the Spurlock Station is located are noted by the Kentucky Geologic Survey to be the best source for groundwater in Mason County (KGS 1978). The water is hard or very hard but otherwise of good quality. In August 1975, a Comprehensive Foundation Investigation of Spurlock Station was conducted and 30 separate exploration test soil borings were drilled to depths ranging from 20 to 145 feet (6 to 44 meters) below the existing ground surface. Groundwater was observed at elevations between 485 to 508 feet (148 to 155 meters) above msl and at a depth ranging between 19 to 48 feet (6 to 15 meters) below the existing ground surface (D&M 1975).

Spurlock Station withdraws 10 MGD (38 MLD) of groundwater before clarification to operate Units 1 and 2. The groundwater is drawn from 14 of 16 wells located on the north, south and east sides of the ash pond and in the vicinity of the coal storage area. Each well has the capacity to produce 850 to 1,000 gallons per minute (gpm) (3,217 to 3,785 liters per minute [lpm]) with an average of 850 gpm (3,217 lpm) for meeting peak needs (SCI 1975). Two of the wells were discontinued from use due to high nitrate concentrations (Holloway 2001).

Wells range in depth from 80 to 110 feet (24 to 33 meters) with wells 2 to 6 and 14 to 16 hydraulically connected to the Ohio River. All wells have been in use for 20 to 30 years. According to Spurlock Station personnel, there has been no drawdown of water levels over the years.

Monitoring wells have been drilled near the ash landfill to monitor for groundwater contaminants. See Section 3.11.1, Ash Disposal, for a full description.

3.5.3 Wastewater and Stormwater

Three types of effluents are produced at the Spurlock Station: facility generated or process wastewater, sanitary wastewater, and stormwater runoff. The sources of the former two are listed in Table 3.5–1. Monitoring points and requirements are discussed at the end of this subsection.

TABLE 3.5–1.—Facility Wastewater and Stormwater Runoff Sources

Process Wastewater	Site Generated Stormwater Runoff
Boiler Blowdown	Site Stormwater Runoff (including a 7.5 acre [3-hectare] switchyard)
Cooling Water Blowdown	Material Storage Runoff
Demineralizer Regeneration	Ash Landfill Runoff
System Chemical Cleaning Rinse Water	Ash Pond Surface Runoff
Plant Drains	Coal Storage Pile Runoff
Sanitary Systems	Emergency Coal Pile Runoff

Process Wastewater

Process wastewater is created by the recirculated water systems of Units 1 and 2. After water enters the boiler and is converted to steam to turn the turbines, the steam then enters the

condenser for conversion to water again. Some of this water is returned to the boiler to become steam for the turbines again and some is sent to the mechanical draft cooling towers. Still other water is sent to cool other equipment such as the generator and turbine oil and compressor cooling systems. Blowdown, generated by both the boiler and cooling towers, is the water removed from those systems after it has served its cooling purpose. Blowdown contains three to four times the amount of dissolved and suspended solids than fresh water and it is removed to prevent buildup within the machinery.

The boiler, cooling towers and condenser systems must be treated to prevent corrosion, scale deposits, sediment deposits and biological deposits. Demineralizers are used to treat water in the boiler cycle with demineralizer regeneration waste generating about 7,000 to 15,000 gallons per day (26,498 to 56,781 liters per day). Other system chemical cleaning rinse water includes chlorine that is used intermittently to control algae in the cooling towers and corrosion inhibitors used throughout the entire system.

All process water effluents for the plant eventually flow to the secondary lagoon and then through a permitted outfall and finally to the Ohio River. The water sources are: (1) boiler blowdown, (2) cooling tower blowdown, (3) clarifier blowdown, (4) reverse osmosis (RO) and demineralizer regeneration and rinse, (5) plant drains, and (6) system chemical cleaning rinse water. The boiler water and plant drains flow into a 750,000-gallon (2,839,050-liter) primary lagoon. This lagoon provides a retention area so that inadvertent discharges can be treated before final discharge. From this lagoon, the effluent flows to a 1,500,000-gallon (5,678,100-liter) secondary lagoon, where it mixes with cooling water and ash sluice water. Clarifier blowdown and ash water are pumped to the 50-acre (20-hectare) ash pond. Demineralizer effluent is neutralized before being pumped to the ash pond. RO pretreatment and rinse waters are also pumped to the ash pond, as are chemical cleaning rinse waters. Through sedimentation, the ash pond allows all solids to settle out before the water is pumped back to the secondary lagoon for monitoring and subsequent discharge into the Ohio River.

Currently, 2.5 MGD (9.5 MLD) of process wastewater is generated. Approximately 10,000 gallons per day (37,854 liters per day) of sanitary wastes are generated by plant washrooms, toilets and drinking fountains. This effluent is collected in the sanitary sewer system that discharges to the Maysville Water Treatment Plant.

Stormwater Runoff

As shown in Table 3.5–1, stormwater runoff from the Spurlock Station originates in several different areas. Stormwater runoff from the main plant area is routed to a culvert under the old Chesapeake and Ohio Railroad tracks (currently operated by CSX Transportation, Inc.) that discharges to the Ohio River through a KPDES permitted outfall that is monitored.

Runoff from the coal storage pile is directed to a holding pond, the Coal Storage Holding Pond. Liquid from this pond and the ash pond is pumped into the secondary lagoon. However, because of evaporation, it is sometimes necessary to pump water from the secondary lagoon into the ash pond to maintain an adequate water level.

Runoff from the ash landfill is channeled to three sedimentation ponds and a man-made wetland before it is discharged to Lawrence Creek. The man-made wetland increases retention time and facilitates metals removal. From Lawrence Creek, the runoff flows into the Ohio River.

Monitoring and Treatment Requirements

All wastewater sources, monitoring and treatment requirements, and outfall points are defined in the Spurlock Station KPDES permit and are summarized in Table 3.5–2. The Spurlock Station KPDES permit was reviewed and reissued effective November 1, 2000 and expires midnight April 30, 2004. Apart from the effluent limitations and monitoring requirements outlined in Table 3.5–2 for each specific outfall, the permit requires the Spurlock Station to develop and implement a Best Management Practices plan consistent with 401 KAR 5:065, Section 2(10) pursuant to KRS 224.70-110, to prevent, or minimize the potential for, the release of pollutants; install Best Practicable Control Technology Currently Available and Best Available Technology Economically Achievable for Unit 1, an existing source subject to the requirement of 40 CFR 423 for Steam Electric Power Generating Point Source Category; adhere to the specific requirements of the New Source Performance Standards for Unit 2, a new source subject to the requirements of 40 CFR 423.15; and initiate a series of biomonitoring acute toxicity tests to evaluate the wastewater toxicity of the discharge from Outfall 001.

TABLE 3.5–2.—Outfall Sources and Monitoring and Treatment Requirements

Outfall Number	Contents	Existing Pollution Abatement Facilities	Discharge Point
001	Combined wastewaters of ash pond overflow (ash transport waters, low volume wastes, coal pile runoff, and storm water runoff), cooling tower waters (Outfalls 002, 003) and metal cleaning wastes (Outfall 004)	Sedimentation and neutralization are provided to the combined wastewater	Ohio River between the USGS mile marks 414 and 413

Effluent Characteristics	Discharge Limitations		Monitoring Requirements	
	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type
Flow (MGD)	Report	Report	Continuous	Recorder
Total Suspended Solids	30 mg/l	62 mg/l	1/Month	Grab
Oil & Grease	6.2 mg/l	6.2 mg/l	1/Month	Grab
Temperature (°F)	95 °F	100 °F	1/Month	Grab
Total Copper	1.0 mg/l	1.0 mg/l	1/Batch	Grab
Total Iron	1.0 mg/l	1.0 mg/l	1/Batch	Grab
Hardness (as mg/l CaCO ₃)	Report	Report	1/Month	Grab
Total Recoverable Metals* (mg/l)	Report	Report	1/Quarter	Grab
Acute Toxicity	N/A	1.00 TU _A	1/Quarter	2 Grabs

TABLE 3.5-2.—Outfall Sources and Monitoring and Treatment Requirements (continued)

Outfall Number	Contents	Existing Pollution Abatement Facilities	Discharge Point	
002	Cooling Tower Waters (Blowdown)	Shock Chlorination and screening.	Outfall 001	
003	Cooling Tower Waters (Blowdown)	Shock Chlorination and screening.	Outfall 001	
		Discharge Limitations	Monitoring Requirements	
Effluent Characteristics	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type
Flow (MGD)	Report	Report	Continuous	Recorder
Free Available Chlorine	0.2 mg/l	0.5 mg/l	Occurrence ⁺	Multiple Grab
Total Residual Chlorine	Report	0.2 mg/l	Occurrence	Multiple Grab
Time of Chlorine Addition (minutes/day/unit)	N/A	120	Occurrence	Log
Priority Pollutants** (mg/l)	Report	Report	1/Year	Grab
Total Chromium	0.2 mg/l	0.2 mg/l	1/Year	Grab
Total Zinc	1.0 mg/l	1.0 mg/l	1/Year	Grab
Outfall Number	Contents	Existing Pollution Abatement Facilities	Discharge Point	
004	Metal Cleaning Wastes	Batch chemical precipitation of metal cleaning wastes	Outfall 001	
		Discharge Limitations	Monitoring Requirements	
Effluent Characteristics	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type
Flow (MGD)	Report	Report	1/Batch	Instantaneous
Total Copper	1.0 mg/l	1.0 mg/l	1/Batch	Grab
Total Iron	1.0 mg/l	1.0 mg/l	1/Batch	Grab
Outfall Number	Contents	Existing Pollution Abatement Facilities	Discharge Point	
005	Coal Pile Runoff Pond Emergency Overflow	No additional treatment	Ohio River between the USGS mile marks 414 and 413	
		Discharge Limitations	Monitoring Requirements	
Effluent Characteristics	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type
Flow (MGD)	Report	Report	1/Discharge	Instantaneous
Precipitation (inches)	Report	Report	1/Discharge	Grab
Total Suspended Solids (mg/l)	Report	Report	1/Discharge	Grab
Hardness (as mg/l CaCO ₃)	Report	Report	1/Discharge	Grab
Total Recoverable Metals* (mg/l)	Report	Report	1/Discharge	Grab
pH (standard units)	Report	Report	1/Discharge	Grab

TABLE 3.5-2.—Outfall Sources and Monitoring and Treatment Requirements (continued)

Outfall Number	Contents	Existing Pollution Abatement Facilities		Discharge Point
006	Substation Stormwater runoff	Untreated		Outfall 001
		Discharge Limitations		Monitoring Requirements
Effluent Characteristics		Monthly Average	Daily Maximum	Measurement Frequency Sample Type
Flow (MGD)		Report	Report	1/Quarter Instantaneous
Precipitation (inches)		Report	Report	1/Quarter Grab
Settleable Solids (mg/l)		Report	Report	1/Quarter Grab
Hardness (as mg/l CaCO ₃)		Report	Report	1/Quarter Grab
pH (standard units)		Report	Report	1/Quarter Grab
Outfall Number	Contents	Existing Pollution Abatement Facilities		Discharge Point
007	Reverse osmosis reject waters	Ion exchange		Ohio River between the USGS mile marks 414 and 413
		Discharge Limitations		Monitoring Requirements
Effluent Characteristics		Monthly Average	Daily Maximum	Measurement Frequency Sample Type
Flow (MGD)		Report	Report	1/Quarter Instantaneous
Dissolved Solids (mg/l)		Report	Report	1/Quarter Grab
Hardness (as mg/l CaCO ₃)		Report	Report	1/Quarter Grab
Total Recoverable Metals* (mg/l)		Report	Report	1/Quarter Grab
Outfall Number	Contents	Existing Pollution Abatement Facilities		Discharge Point
008	Ash Landfill Runoff	Sedimentation		Lawrence Creek
		Discharge Limitations		Monitoring Requirements
Effluent Characteristics		Monthly Average	Daily Maximum	Measurement Frequency Sample Type
Flow (MGD)		Report	Report	1/Quarter Instantaneous
Precipitation (inches)		Report	Report	1/Quarter Grab
Total Suspended Solids (mg/l)		35 mg/l	70 mg/l	1/Quarter Grab
Total Recoverable Metals* (mg/l)		Report	Report	1/Quarter Grab
Hardness (as mg/l CaCO ₃)		Report	Report	1/Quarter Grab
		Report	Report	1/Quarter Grab
Outfall Number	Contents	Existing Pollution Abatement Facilities		Discharge Point
009	Plant intake	N/A		N/A
		Discharge Limitations		Monitoring Requirements
Effluent Characteristics		Monthly Average	Daily Maximum	Measurement Frequency Sample Type
Flow (MGD)		Report	Report	Continuous Recorder
Temperature (°F)		Report	Report	Continuous Recorder
Total Suspended Solids (mg/l)		Report	Report	1/Month Grab
Hardness (as mg/l CaCO ₃)		Report	Report	1/Month Grab
Total Recoverable Metals* (mg/l)		Report	Report	1/Month Grab
pH (standard units)		Report	Report	1/Quarter Grab

*Total Recoverable Metals: Metals, Cyanide and Total Phenols (Antimony, Arsenic, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Silver, Thallium and Zinc).

**Priority Pollutants: the 126 pollutants listed in 40 CFR 423 Appendix A.

*Occurrence: during periods of chlorination.

3.6 LAND USE

This section discusses the existing land use resources in the vicinity of the Spurlock Station and the proposed transmission line corridor crossing into Brown County, Ohio. The discussion also includes a description of recreational resources within the project vicinity.

3.6.1 Facilities

The Spurlock Station is located on an approximately 2,500-acre (1,011-hectare) property owned by EKPC along the south side of the Ohio River within Mason County, Kentucky. The EKPC property currently includes two coal-fired boilers, associated control equipment, a substation, a coal stockpile and handling system, a tailings pond, stormwater runoff ponds, and cooling towers. In addition, the ash disposal landfill on the property currently encompasses approximately 190 acres (77 hectares). The balance of the property is open and forested land with multiple double circuit transmission lines extending south from the substation. The property is bordered to the north by the Ohio River. To the east of the generating station is Inland Paperboard and Packaging, a paper products recycling and manufacturing facility. The Inland property contains a section of cultivated land facing the EKPC property. The areas to the south and west of the property are primarily agricultural land, intermixed with wooded hills and scattered residences. Lawrence Creek and numerous smaller creeks traverse the area. The downtown district of the city of Maysville is approximately 4.5 miles (7.2 kilometers) southeast of the Spurlock Station. Highway 8, connecting Spurlock Station to downtown Maysville, travels along the Ohio River through forested land, with occasional residences and commercial facilities.

The land area proposed for the new Units 3 and 4 and associated facilities is within the existing EKPC property, adjacent to the existing Unit 2. The land area has been previously disturbed and graded. The area to the east of the existing boilers that would contain the additional cooling towers has also been previously graded and is currently maintained with vegetation. A gated perimeter fence surrounds the EKPC property.

3.6.2 Transmission Line

The proposed route for the 3.5-mile (5.7-kilometer) 345-kV transmission line extends northeasterly from the generating station across the Ohio River and into Brown County, Ohio, where it will interconnect with the existing power grid. As it exits the EKPC property, the proposed transmission line would parallel existing railroad tracks and cross cultivated open land on the Inland Paperboard and Packaging industrial property. The proposed transmission line would then turn northeast and cross the Ohio River paralleling on either the east or west side an existing Kentucky Utilities 138-kV Transmission Line. The land use on the north side of the Ohio River is primarily forested land with agricultural land interspersed. Scattered residences are located along the Ohio River and along Flaughter Hill Road and Scofield Road traversing the area. The forested land along the proposed route currently contains an approximately 150-foot (46-meter) wide cleared right-of-way for the existing Kentucky Utilities Transmission Line.

Recreation. The Ohio River in the vicinity of the EKPC property is used for recreational boating. Numerous boat launches and public access sites are located in the area. Eagle Creek, an Ohio River tributary 2 miles (3 kilometers) northwest of the EKPC property, has a public access site for fishing, sailing, canoeing, water skiing, and picnicking. Lake Charles, 1 mile (0.6 kilometers) southeast of the EKPC facility, is also utilized for similar recreation. There are no Kentucky State Parks within 50 miles (82 kilometers) of the EKPC property. The Daniel Boone National Forest is approximately 25 miles (41 kilometers) to the southeast of Maysville. In Ohio, the Wayne National Forest and Shawnee State Forest are both over 50 miles (82 kilometers) east of the proposed project area. There are no National Wildlife Refuges or Native American Lands in the vicinity of the proposed project.

3.7 VISUAL RESOURCES

This section discusses the existing visual resources in the vicinity of Spurlock Station and proposed transmission line corridor crossing into Brown County, Ohio. The discussion includes evaluation of the quality of the existing landscape and the sensitivity of the existing visual resources to change associated with the proposed project.

In evaluating the visual quality of the existing landscape and modifications, the following aesthetic values are considered:

- Form (topographical variation, mountains, valleys)
- Line/Pattern (ridges, rivers, roads, pipeline and transmission line corridors)
- Color/Contrast (brightness, diversity)
- Texture (vegetation, buildings, disturbed areas)

The sensitivity of the existing visual resources to change associated with the proposed project is based upon a number of factors: (1) the extent to which the existing landscape is already altered from its natural condition; (2) the number of people within visual range of the area, including residents, highway travelers, and those involved in recreational activities; and (3) the degree of public and agency concern for the quality of the landscape.

3.7.1 Facilities

Spurlock Station is located on an approximately 2,500-acre (1,011-hectare) piece of property along the south side of the Ohio River within Mason County, Kentucky. The property is on the northern edge of the Outer Bluegrass Physiographic Region, characterized by a rolling plateau that becomes more rugged near the edges. The EKPC property and surrounding area is a mixture of wooded hills and valleys, agriculture and low-density residences, and industry along the Ohio River. The topography of the land is dominated by the bluffs of the Ohio River Valley, at heights of up to 400 feet (120 meters). Lawrence Creek and numerous smaller creeks traverse the area. The Ohio River is approximately 0.25 miles (0.41 kilometers) wide along the EKPC property line. The downtown district of the city of Maysville is approximately 4.5 miles (7.2 kilometers) southeast of the Spurlock Station.

Spurlock Station is accessed through a gated perimeter fence and access road. The most visible features of the existing facilities include a 17-story cream colored building, two 805-foot (245-meter) cement stacks, and clouds of steam rising into the air from the cooling towers. These features are visible from portions of Highway 8 and Highway 52 (along the south and north sides, respectively, of the Ohio River), including several residences in the area. Views in the area are partially obscured by the hilly terrain and trees in the area.

There are 19 designated scenic byways located throughout Kentucky, though none are located within Mason County. In Ohio, the Ohio River Scenic Route has been designated as a National Scenic Byway, with almost continuous views of the Ohio River stretching for 462 miles (758 kilometers) from Cincinnati to Pennsylvania. Highway 52, from which there are partial views of the proposed project site, is included in this scenic byway.

The nearest national forest to the proposed project is the Daniel Boone National Forest, approximately 25 miles (41 kilometers) southeast of Maysville. There are nine sections of river designated as Kentucky Wild Rivers, characterized by undisturbed shorelines and vistas. The Red River, which runs through the Daniel Boone National Forest, is the closest Kentucky Wild River to the project site. For a complete discussion of recreational activities in the proposed project vicinity see Section 3.6, Land Use.

3.7.2 Transmission Line

The proposed route for the 3.5-mile (5.6-kilometer) 345-kV transmission line extends northeasterly from the project site across the Ohio River and into Brown County, Ohio, where it will interconnect with the existing power grid. The area crossed by the proposed transmission line is also within the Outer Bluegrass Physiographic Region, of the same character as surrounding the EKPC site. An existing Kentucky Utilities 138-kV Transmission Line crosses the Ohio River and parallels the proposed route, along a 150-foot (46-meter) wide cleared right-of-way through a mixture of agricultural and forested land. Multiple residences are contained within the viewshed of the existing transmission line, including several along the north bank of the Ohio River directly across from Spurlock Station.

3.8 SOCIOECONOMICS

This section describes current socioeconomic conditions within a region of influence where the majority of the Proposed Action workforce is expected to reside, based on proximity to the site and data received from EKPC. EKPC has indicated that all labor for construction of the project would be supplied from labor unions based in Cincinnati, Ohio and it is expected that individuals working on the construction of the two new units are currently employed in construction work on the Spurlock Station site. This requires an analysis of the area between the Cincinnati Metropolitan Area and the project site location in Maysville, Kentucky. Due to the size of the metropolitan area, only those counties considered central in the Cincinnati Metropolitan Area were included in the determination of the region of influence. The region of influence is therefore established as a nine-county area comprised of Boone, Bracken, Campbell, Kenton, Mason, and Pendleton Counties in Kentucky and Brown, Clermont, and Hamilton Counties in Ohio. The region of influence covers an area of 2,636 square miles (6,827 square kilometers) around the project site (Census 2001a through 2001i).

This region of influence is only applicable for this resource area. Social and economic impacts are distributed over a wider area and the selection of a comparatively larger area of analysis reflects that. The larger area is due to the fact that individuals who travel from as far away as Cincinnati, for example, to work on the site will not use their disposable income solely within Mason County. Rather, they would spend most of it closer to their homes and this is where the economic impact would be experienced.

3.8.1 Population and Housing

The central Cincinnati Metropolitan Area, comprised of Boone, Campbell, and Kenton Counties in Kentucky and Clermont and Hamilton Counties in Ohio, is the major population center in the region of influence. The city of Cincinnati, in Hamilton County, was home to 331,285 people in 2000 (Census 2000a) and the central Cincinnati Metropolitan Area had a population of 1,349,351 (Census 2001a, 2001c, 2001d, 2001h, 2001i). The Cincinnati Metropolitan Area is largely suburban in character, with the exception of Hamilton County, which is largely urban in character. Pendleton County, Kentucky and Brown County, Ohio are considered outlying counties of the Cincinnati Metropolitan Area and range from suburban to rural in character. Bracken and Mason Counties in Kentucky are outside of the metropolitan area and are largely rural in character. The town of Maysville, with a population of 8,993, is the largest town in these two counties (Census 2000b).

Over the last 40 years, the populations of Kentucky and Ohio have grown at a relatively moderate rate. In the past decade, Kentucky's population increased by 9.7 percent and Ohio's by 4.7 percent, which was a significantly higher growth rate than over the previous decade. Though the population of the region of influence did not increase at the same rate, it still grew by 4.4 percent over this period. Four of the counties experienced moderate growth; however, the population of Boone County grew by 49.3 percent, Pendleton County by 19.6 percent, Brown County by 20.9 percent, and Clermont County by 18.5 percent, while Hamilton County experienced a decrease in population of 2.4 percent. The population growth of the region of influence is expected to continue at a nearly equivalent rate over the coming decade, with

projections showing a 4.5 percent increase. Boone, Pendleton, Brown, and Clermont Counties are expected to continue to have high growth over the next 10 years. The populations of Kentucky and Ohio are projected to increase by 4.8 and 4.0 percent, respectively, in the next 10 years. Table 3.8–1 presents historic and projected population growth within the region of influence and both states.

TABLE 3.8–1.—Historic and Projected Population

	1960	1970	1980	1990	2000	2010
Boone County	21,940	32,812	45,842	57,589	85,991	109,645
Bracken County	7,422	7,227	7,738	7,766	8,279	8,472
Campbell County	86,803	88,501	83,317	83,866	88,616	91,317
Kenton County	120,700	129,440	137,058	142,031	151,464	155,369
Mason County	18,454	17,273	17,765	16,666	16,800	16,377
Pendleton County	9,968	9,949	10,989	12,036	14,390	16,133
Brown County	25,178	26,635	31,920	34,966	42,285	47,492
Clermont County	80,530	95,725	128,483	150,187	177,977	196,869
Hamilton County	864,121	924,018	873,224	866,228	845,303	854,014
ROI	1,235,116	1,331,580	1,336,336	1,371,335	1,431,105	1,495,688
Kentucky	3,038,156	3,218,706	3,660,777	3,685,296	4,041,769	4,235,802
Ohio	9,706,397	10,652,017	10,797,630	10,847,115	11,353,140	11,805,877

Source: Census 1995a, 1995b, 2001a through 2001i, KSDC 1999, OSR 1990.

Population projections were calculated using established rates applied to 2000 Census counts.

ROI = Region of Influence

Table 3.8–2 presents housing characteristics in the region of influence. There were a total of 555,785 housing units in the region of influence in 1990. According to 1990 Census data, approximately 60.7 percent of the houses were single-family units, approximately 34.9 percent were multi-family units, and approximately 4.4 percent were mobile homes. An estimated 6.1 percent, or 34,000, of the housing units were vacant. More than 62 percent of the occupied units were owner-occupied while almost 38 percent were rental units (Census 1992a through 1992i).

TABLE 3.8–2.—Region of Influence Housing Characteristics

	Total Number of Housing Units	Number of Owner- Occupied Units	Owner- Occupied Vacancy Rates	Median Value	Number of Occupied Rental Units	Rental Vacancy Rates	Median Monthly Contract Rent
Boone County	21,746	14,488	1.5%	\$74,500	5,639	9.5%	\$356
Bracken County	3,166	2,166	1.6%	\$39,400	706	6.0%	\$135
Campbell County	32,910	21,268	1.1%	\$62,300	9,901	7.3%	\$298
Kenton County	56,086	34,678	1.3%	\$65,200	18,012	7.7%	\$308
Mason County	7,089	4,241	1.5%	\$43,800	2,296	5.9%	\$171
Pendleton County	4,782	3,254	1.8%	\$43,700	1,078	6.3%	\$185
Brown County	13,270	9,404	1.4%	\$49,200	2,975	5.0%	\$212
Clermont County	55,315	38,028	1.3%	\$71,200	14,698	7.4%	\$340
Hamilton County	361,421	197,551	1.4%	\$72,200	141,330	7.8%	\$304
ROI	555,785	325,078	N/A	N/A	196,635	N/A	N/A

Source: Census 1992a through 1992i.

ROI = Region of Influence

In 1990, the median value of owner-occupied housing in the region of influence ranged from \$39,400 in Bracken County to \$74,500 in Boone County. In 1990, median monthly rent ranged from \$135 in Bracken County to \$356 in Boone County.

3.8.2 Employment and Income

Employment by sector over the last decade has changed slightly, as shown in Table 3.8–3. The major shift in employment has occurred as employment in the manufacturing and, to a lesser extent, government sectors has decreased, leading to an increase in employment in the service sector. The service sector provides the highest percentage of the employment in the region of influence, with 31.6 percent, followed by the wholesale and retail trade and manufacturing sectors, with 23.6 percent and 14.0 percent, respectively. Farm employment has decreased over the last decade, providing 1.1 percent of employment in 1990 but only 0.9 percent in 1997 (BEA 1999). Table 3.8–3 presents employment levels for the major sectors of the region of influence economy.

TABLE 3.8–3.—Region of Influence Employment by Sector (Percent)

Sector	1990	1997
Services	28.0	31.6
Wholesale and Retail Trade	23.5	23.6
Manufacturing	17.3	14.0
Government and government enterprises	11.3	10.3
Finance, insurance, and real estate	7.5	8.0
Transportation and public utilities	5.3	5.2
Construction	5.2	5.4
Farm employment	1.1	0.9
Mining	0.1	0.1
Other Sectors	0.6	0.6

Source: BEA 1999.

The region of influence experienced slight changes to the labor force throughout the late 1990s. The labor force increased from 739,106 in 1995 to 746,300 in 2000, which translates to a 5-year growth rate of 1 percent. Employment experienced growth as well, increasing from 707,868 in 1995 to 719,903 in 2000, a 5-year growth rate of 1.7 percent. The region of influence unemployment rate was 4.2 percent in 1995, falling to 3.5 percent in 2000, as shown in Table 3.8–4. Bracken County experienced a large decrease in its unemployment rate during this period, with the rate dropping from 5.9 percent in 1995 to 3.4 percent in 2000. Kentucky's unemployment rate also fell significantly, dropping from 5.4 percent in 1995 to 4.1 percent in 2000. The unemployment rate for Ohio was also 4.1 percent in 2000 (KDES 1995, 2000, OLM 1995, 2000, 2001).

The average income in the region of influence was \$32,486 in 1999, an over 18 percent increase from the 1995 level of \$27,391. Average income ranged from \$18,769 in Bracken County to \$33,919 in Hamilton County. The average income in Kentucky was \$26,911 and in Ohio was \$30,512 while the U.S. average was \$32,109 in 1999 (CBP 1995a through i, 1999a through l).

TABLE 3.8-4.—Region of Influence Unemployment Rates (Percent)

	1995	2000
Boone County	4.1	2.8
Bracken County	5.9	3.4
Campbell County	4.5	3.3
Kenton County	4.2	3.4
Mason County	5.4	3.0
Pendleton County	4.7	3.6
Brown County	5.8	6.0
Clermont County	4.3	3.6
Hamilton County	4.1	3.6
ROI	4.2	3.5
Kentucky	5.4	4.1
Ohio	4.8	4.1

Source: KDES 1995, 2000, OLMI 1995, 2000, 2001.

ROI = Region of Influence

3.8.3 Community Services

This environmental assessment presents the availability of public schools and medical services in the project's region of influence. Data on fire and police services is not readily available for the region of influence. However, the region of influence contains the Cincinnati Metropolitan Area and large fire and police services associated with major metropolitan areas. Other fire and police stations are located throughout the region of influence; however, the exact numbers of personnel and equipment in various locations is not available.

There are approximately 60 school districts serving the region of influence, with the majority of them located in the Cincinnati Metropolitan Area. These districts utilize over 13,200 teachers to educate over 221,000 students (EDU 2001a). There are also 153 private schools in the region of influence educating approximately 55,300 students (EDU 2001b). There are a number of institutions of higher learning in the region of influence, including the University of Cincinnati.

Twenty-three major hospitals are located in the region of influence, 16 in Cincinnati and 1 in Maysville. There are 6,031 beds in these hospitals and approximately 24,000 hospital personnel throughout the region of influence (AHA 1995). The majority of the hospital beds and physicians are located in the city of Cincinnati in Hamilton County. The hospital located in Maysville has 111 beds and is serviced by 258 personnel.

3.9 ENVIRONMENTAL JUSTICE

Pursuant to Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (59 *Federal Register* 32), and U.S. Department of Agriculture's implementing Departmental Regulation 5600-2 (December 15, 1997), this section identifies any minority or low-income populations that could be subject to disproportionate environmental impacts or health effects from the Proposed Action. The affected environment for environmental justice issues is more focused than that of the socioeconomic analysis because the majority of the impacts are experienced in close proximity to the project site.

Environmental justice guidance developed by the Council on Environmental Quality defines "minority" as individuals who are members of the following population groups: American Indian or Alaskan Native, Asian or Pacific Islander, Black, or Hispanic (CEQ 1997). Minority populations are identified when either the minority population of the affected area exceeds 50 percent or the percentage of minority population in the affected area is meaningfully greater than the minority population percentage in the general population in the surrounding area or other appropriate unit of geographical analysis. Low-income populations are identified using statistical poverty thresholds from the Bureau of Census. The current threshold was defined in 2000 as 1999 income less than \$17,463 for a family of four. The threshold applicable for this analysis was defined in 1990 as 1989 income less than \$12,674 for a family of four.

The environmental impacts from most projects are typically concentrated at the actual project site and tend to decrease as distance from the project site increase. Due to this relationship, the environmental justice analysis examines smaller geographic regions around the project site for which statistical data is available. The area analyzed for environmental justice has no relation to, nor should be in any way mistaken for, the nine-county region of influence established for the socioeconomic analysis. By nature, the economic impacts associated with a project occur over a wider area (see Section 3.8, Socioeconomics).

The Proposed Action would occur at Spurlock Station, located 4.5 miles (7.2 kilometers) northwest of Maysville, in Mason County, Kentucky. The site is on the Ohio River, across from Brown County, Ohio. These two counties have the greatest potential to experience environmental and human health impacts as a result of this project. Therefore, these two counties will comprise the area considered for the environmental justice analysis. The town of Ripley is located just north of the plant across the Ohio River. The towns of Maysville and Ripley will be singled out as part of the affected environment for environmental justice due to their proximity to the project location.

This section details the racial composition of the two counties and the town of Maysville utilizing data from the 2000 Census. Racial composition data is also presented for Kentucky, Ohio, and the United States to provide other geographic regions for comparison.

The most recent data available for low-income populations comes from a 1997 computer model estimate, as opposed to an actual count (Census 2000a). This data is available at the county level. More refined data is available from an economic census study conducted in 1989 and this

data will be used to examine the low-income population of Maysville, Kentucky and Ripley, Ohio. The data for Kentucky, Ohio, and the United States are also presented to provide other geographic regions for comparison.

Table 3.9–1 presents the racial composition of all geographic areas to be considered in the environmental justice analysis.

**TABLE 3.9–1.—RACIAL COMPOSITION OF AREAS AFFECTED BY THE PROPOSED ACTION
(PERCENT)**

	One Race						Two or More Races	Hispanic	
	White	African American	American Indian	Asian	Pacific Islander	Other		Hispanic	Non- Hispanic
Maysville	86.0	11.5	0.1	0.6	N/A	0.5	1.2	0.9	99.1
Mason County	90.9	7.2	0.1	0.4	N/A	0.6	0.9	1.0	99.0
Kentucky	90.1	7.3	0.2	0.7	N/A	0.6	1.1	1.5	98.5
Ripley	91.7	6.6	0.1	0.2	N/A	0.2	1.3	0.7	99.3
Brown County	98.1	0.9	0.2	0.1	N/A	0.1	0.6	0.4	99.6
Ohio	85.0	11.5	0.2	1.2	N/A	0.8	1.4	1.9	98.1
United States	75.1	12.3	0.9	3.6	0.1	5.5	2.4	12.5	87.5

Source: Census 2000b, 2001e, 2001g, 2001j.

Both Mason and Brown Counties have a smaller or equivalent percentage of residents of each minority group than their respective states and the country as a whole. The town of Maysville has a higher percentage of African-American residents than Mason County and Kentucky; however, the percentage is below that of the national average. Maysville also has a higher percentage of Asian-Americans and persons of two or more races than Mason County; however, these levels are equivalent with Kentucky levels and are significantly smaller than national levels. Ripley has a significantly higher level of African-American and Hispanic residents and residents of two or more races than Brown County, yet all three are lower than Ohio levels.

The percentage of the population considered low-income in Maysville was 20.7 in 1989 (Census 1990a). This figure is higher than the level of Mason County, 18.2 percent, and the State of Kentucky, 16.0 percent (Census 2001e). The percentage of the population considered low-income in Ripley was 24.1 in 1989 (Census 1990b). This is much higher than the level of persons below the poverty level in Brown County at 12.0 percent, which is slightly higher than the state of Ohio level of 11.0 percent (Census 2001g). The figures for each county are higher than their respective states' averages. The level of low-income population in Kentucky is higher than the national average of 13.3 percent (Census 2001j), yet the levels for Ohio and Brown County are below the national average.

3.10 INFRASTRUCTURE

In this section, the existing infrastructure of Spurlock Station is outlined.

Spurlock Station is a 2,500-acre (1,011-hectare) coal-fired electric generating station with two conventional pulverized-coal boilers that burn low sulfur content coal. Unit 1, a 300-MW, dry bottom wall fired unit with a maximum continuous heat input rating of 3,500 mmBTU per hour, went online in August 1977. Unit 2, a 500-MW, dry bottom, tangentially fired unit with a maximum continuous heat input rating of 4,850 mmBTU per hour, was operational in October 1981. Equipment for each unit includes a turbine-generator, condenser and air removal equipment, condenser cooling system with mechanical draft cooling towers, coal-fired steam generator with associated heat removal equipment and auxiliaries, an 805-foot (245-meter) stack, electrostatic precipitators, as well as other systems necessary to support plant operations and buildings to house equipment.

The water that feeds the boilers is generated from 14 of 16 groundwater wells located on the north, south and east sides of the ash pond and in the vicinity of the coal storage area. An intake pipe brings water into the station from the Ohio River. Both the groundwater wells and intake pipe have pumps and pipes to move the water to the units.

Each of the units is connected to a switchyard that contains circuit breakers and automatic switches to turn power on and off for different transmission lines. The energy generated by the units is transmitted to the substation. The substation controls the voltage level of the energy before it is sent to the many transmission lines located adjacent to the substation. The Spurlock Station transmission lines connect to distribution grids in Kentucky.

Because the two units were built in different years, they conform to different air quality emissions regulations and thus have different air emissions control equipment. Unit 1, licensed prior to PSD regulations, has an electrostatic precipitator to control emissions of particulate matter and low-NO_x burners to limit NO_x emissions. Unit 2, subject to PSD regulations, has not only a boiler equipped with an electrostatic precipitator for particulate matter emissions control and low-NO_x burners to limit NO_x air emissions, but also a flue gas desulfurization system for SO₂ emissions control. EKPC is currently installing selective catalytic reduction units on both Units 1 and 2 to further reduce NO_x emissions. Aqueous ammonia will be injected into the selective catalytic reduction units to reduce the NO_x to primarily molecular nitrogen and water. Four 30,000-gallon (113,562-liter) aboveground tanks with aqueous ammonia will be located outside Units 1 and 2 (2 tanks per unit) and one 3,400-gallon (12,870-liter) aboveground tank located outside Unit 1. Construction of the selective catalytic reduction units is expected to be completed by the fall of 2002.

Specific coal-related infrastructure includes the barge dock, unloaders, Chesapeake and Ohio Rail tracks and car dumper that convey coal to the site and unload it; the coal storage pile and coal storage holding pond that catches stormwater runoff from the pile; the coal conveyor system that moves the coal to the crusher house and then to the units; an ash silo that holds the ash created from the burned coal; roads to carry trucks transporting ash from the silo to the ash landfill; and an ash pond that holds wet bottom ash and ash sluicing water for sedimentation and

later discharge to the secondary lagoon, and ultimately to the Ohio River. The ash landfill also has stormwater sedimentation ponds, a man-made wetland that further filters the stormwater runoff, and an outfall that discharges the water to Lawrence Creek.

Other infrastructure equipment includes two 350,000-gallon (1,315,440-liter) aboveground storage tanks containing fuel oil to start the units after shutdowns; two underground storage tanks containing diesel and gasoline for the trucks that convey ash to the ash landfill; and several other storage tanks for the demineralizers and other cleaning chemicals necessary to operate and maintain the units. Two lagoons, a 750,000-gallon (2,839,030-liter) primary and a 1,500,000-gallon (5,678,100-liter) secondary lagoon, hold all process wastewater generated by the operation and maintenance of Units 1 and 2. Wastewater is treated and monitored in the lagoons before discharge to the Ohio River. There are a total of eight discharge outfalls; four are internal outfalls connected to an outfall that discharges to the Ohio River, three discharge to the Ohio River, and one discharges to Lawrence Creek. Spurlock Station also has a sanitary collection system for wastewater generated by plant washrooms, toilets and drinking fountains that discharge to the Maysville Water Treatment Plant.

The Kentucky Utilities 138-kV Transmission Line skirts the south edge of the ash pond, crosses the Ohio River and connects to the Stuart-Zimmer 345-kV Transmission Line in Brown County, Ohio.

3.11 WASTE MANAGEMENT

3.11.1 Ash Disposal

Spurlock Station operates a landfill for ash disposal and for asbestos waste. The landfill is located approximately 1 mile (1.6 kilometers) from the plant site. In 2000, Spurlock Station generated 262,219 tons of fly ash and 19,536 tons of bottom ash from its two generating units. In addition to ash, asbestos wastes originating from EKPC members, Headquarters, and other power stations are also disposed of in the ash landfill.

The landfill is permitted by Kentucky Division of Waste Management and is inspected at least weekly by a certified landfill inspector. Inspection includes checking for nuisance dust, insuring proper runoff controls are maintained, and visual inspection of compaction.

Three monitoring wells, one background well and two downgradient wells, have been drilled at the landfill sedimentation ponds to monitor the uppermost aquifer for contaminants. The wells were drilled to depths ranging from 28.5 to 32.8 feet (9 to 10 meters) and groundwater was not found. The limestone and shale geologic bedrock formations that underlie the landfill area are known to be poor aquifers.

3.11.2 Toxic and Hazardous Wastes

Spurlock Station is a conditionally exempt small quantity generator of toxic and hazardous wastes and is registered with the Kentucky Department of Environmental Protection (ID Number KYD072865272). A conditionally exempt small quantity generator is defined as a generator that produces less than 200 pounds/month (100 kilograms/month) of waste. This designation does not require an EPA identification number, annual registration of hazardous waste activity, use of manifests in shipping hazardous waste, or sending hazardous waste to a permitted or interim status Subtitle C waste management facility. conditionally exempt small quantity generators must determine whether their wastes are hazardous in accordance with 40 Code of Federal Regulations 261.5(g) and may accumulate hazardous waste onsite indefinitely provided that the total amount of waste accumulated does not exceed 2,200 pounds (998 kilograms) in one calendar month.

Spurlock Station typically generates less than 1,000 pounds/year (450 kilograms/year) of toxic and hazardous waste. However, on occasion the plant has generated more than 2,200 pounds (1,000 kilograms) during a year. When this occurs, the status of the plant is changed to the appropriate registration until the waste is properly disposed. Once the waste is disposed, Spurlock Station returns to its conditionally exempt small quantity generator status.

The primary hazardous wastes generated by Spurlock Station include halogenated and non-halogenated hydrocarbons, and halogenated and non-halogenated solvents, paint wastes, used motor oils and transmission fluids. There are also numerous chemicals throughout the station that are present in small quantities. Many of these reagent chemicals are located in the lab or are cleaning solutions used by the janitorial staff. Other miscellaneous wastes include batteries, light bulbs, and asbestos. Asbestos found on the plant site is cementitious material such as transite or

tar-impregnated gasket material. An asbestos survey of Unit 1 was conducted and none of the 150 samples of thermal system insulation collected tested positive for asbestos. Both units at Spurlock Station are believed to not contain asbestos material.

Currently, hazardous wastes are collected in secure designated areas throughout the plant site and are stored in suitable, labeled containers and/or 55-gallon (208 liter) drums. All use and management of hazardous waste containers is in accordance with the 401 KAR 35:180, Sections 2, 3, and 4. Wastes are collected in secured areas such as the lab and oil storage facilities until sufficient quantities accumulate. They are then transferred under the supervision of the safety coordinator to a temporary protected storage area. Wastes are temporarily stored in the lime storage facility because it is a low traffic area. All wastes generated at the plant site are disposed of in accordance with Federal, state, and local regulations.

The Spurlock Station plant has been designated an “off-specification used oil fuel” burner under 401 KAR 36:050, Section 5. Used oils generated onsite are burned for energy recovery.

EKPC uses established waste transfer and disposal entities to transport and dispose of its wastes. Hazardous wastes are transferred to Safety Kleen’s Greenbriar facility and from there to incinerators or approved hazardous waste landfills. BFI, Inc., is the waste disposal contractor responsible for universal wastes (e.g., fluorescent light bulbs and batteries) at the plant site. Universal wastes are shipped to registered universal waste collection sites in appropriate containers.

EKPC has a Spill Prevention, Control, and Countermeasures Plan for Spurlock Station which outlines Best Management Practices for addressing oil and other toxic and hazardous materials spills. All areas where potential spills could occur are checked on a regular basis and any leaks or spills constituting a hazardous reportable incident would be immediately contained and appropriate parties notified. In addition to the plan, EKPC has secondary containment structures around tanks containing oil and toxic and hazardous substances. It is noteworthy to mention that the Spurlock facility has had no reportable spill since January 10, 1973 (EKPC 2001).

3.11.3 Solid Wastes

Spurlock Station generates various office wastes, scrap metal, and construction debris. Solid waste generated from day-to-day activities at the plant site are stored onsite in dumpsters. Solid wastes generated at the plant site are characterized for proper management and disposal and to prevent improper disposal of hazardous wastes. Whenever possible, they are recycled. Solid wastes generated are transported by waste disposal contractors Rumpke or BFI to the Mason County Landfill.

3.11.4 Other Wastes

Other wastes included plant process wastes such as boiler cleaning wastes, boiler blowdown, excess service water, wastewater from the water treatment process (see Section 3.5, Water Resources) and stormwater runoff. Boiler cleaning wastes are treated to precipitate out the metal content. A Toxic Characteristic Leachate Procedure is then conducted on the precipitate. If the

precipitate is found to be hazardous, it is disposed of according to the requirements outlined above for hazardous waste disposal. The liquid waste is treated to meet the limits specified in the KPDES permit and then transferred to the primary and secondary lagoons.

3.12 OCCUPATIONAL AND PUBLIC HEALTH AND SAFETY

Current activities associated with routine operations at Spurlock Station have the potential to affect worker and public health. Workers are exposed to occupational hazards similar to those experienced at most industrial work sites. The health and safety of the public could be impacted by the release of hazardous materials and/or hazardous waste during transport or due to an accidental release at the plant. Persons living near high-voltage transmission lines and workers involved in the construction and maintenance of transmission lines are also likely to be exposed to electric and magnetic fields.

The following discussion characterizes the current human health impacts from the operation of Spurlock Station. It is against this baseline that the potential incremental and cumulative impacts associated with the proposed action can be compared and evaluated.

3.12.1 Worker Health

Worker health and safety issues at Spurlock Station pertain to exposure to process chemicals and typical industrial work-related injuries. From January 1, 1995 to September 24, 2001, there were 121 typical industrial work-related injuries (falls, bruises, cuts, repetitive stress injuries, etc.). Fifty-nine (49 percent) did not require medical treatment or time away from work; 10 (8 percent) were lost time accidents requiring one or more days off of work; and 52 (43 percent) required treatment by a physician, but none lost time from work.

All employees that handle, use, transport, store or have contact with potentially hazardous or toxic materials are trained in safe and proper handling methods and in spill prevention and control. Spurlock Station has a Spill Prevention, Control, and Countermeasures Plan to reduce the impact to workers, the public, and the environment due to an accidental release/spill.

3.12.2 Public Health

The accidental release of chemicals to the air or water is the primary health and safety risks for the public. Spurlock Station has developed a Spill Prevention, Control, and Countermeasures Plan in the event of an accidental release to reduce the impact to public health and safety and the environment. There have been no reportable spills of hazardous substances at Spurlock Station since January 10, 1973 (EKPC 2001).

3.13 TRAFFIC AND TRANSPORTATION/AVIATION

This section discusses the major road and rail transportation routes to the proposed project site. Existing traffic levels are discussed for each method of transportation. The region used for the analysis is the same nine-county region of influence established in Section 3.8, Socioeconomics.

3.13.1 Roadways

The primary access routes to the region of influence are Interstates 71, 74, and 75, which all converge in Cincinnati. The Cincinnati Metropolitan Area is also served by Interstate 275, which is a beltway around the city itself. The primary access routes to Maysville are Kentucky Highway 9, which runs east from the Cincinnati Metropolitan Area, and U.S. Route 62, which runs north to south and crosses the Ohio River in town. The route traveled to the project site by the construction workers coming from Cincinnati will be along Kentucky Highway 9 into Maysville. In order to access the project site, workers will also have to use Kentucky Highways 8, 1597, and 3056 for brief distances. The site access road intersects with Kentucky Highway 8 just north of Maysville. Construction vehicles will primarily utilize Kentucky Highways 8 and 10 in Mason County.

Current and recent daily traffic loads for roads that will potentially be impacted by this project are presented in Table 3.12-1. All data was obtained from the Kentucky Transportation Cabinet's Traffic Counts searchable database computer program, which provides historic traffic count data for Interstates and Kentucky and County Highways throughout the state (CTS 2001). The Actual Count data presented in the table is the average number of car trips per 24 hours for that particular road segment. The mileposts presented in the table are those established by the Kentucky Transportation Cabinet for the purposes of collecting traffic counts. The site access road intersects Kentucky Highway 8 between milepost 7.6 and milepost 11.0. Data is presented along a route that travels from the project site to Interstate 275 near Cincinnati. Mileposts along Kentucky Highway 9 increase as one travels west along the road. Milepost 0.0 in one county is equivalent to the last milepost in the previous county. Mileposts for Kentucky Highways 8 and 10 increase in value as one heads east along the roads. Milepost 12.3 on Kentucky Highway 8 is the equivalent of milepost 3.8 on Kentucky Highway 10, as this signifies the point at which these roads intersect in the town of Maysville.

3.13.2 Railroads

The project site is located along a freight rail line segment that runs between Covington and Maysville, Kentucky. The line segment is owned and operated by CSX Transportation, Inc., of Jacksonville, Florida, and has been operating in the region for an extended period of time as part of the old Chesapeake and Ohio Railroad. Amtrak also runs passenger trains along this line segment. Existing rail traffic data for the line are currently unavailable. The project site also contains adequate rail yard capacity that runs off of the main freight line.

3.13.3 River Transport

The project site is located on the bank of the Ohio River between U.S. Geological Survey river miles 414.7 and 412.7. This section of the Ohio River is the pool created by the Captain Anthony Meldahl Dam located at mile 436.2. The site is downstream of the Greenup Locks and Dam located at mile 341. Table 3.13–2 shows a breakdown by commodity of the total tonnage shipped through the Greenup Locks and Dam in 1999. The total tonnage of commodities shipped through the Greenup Locks and Dams was over 71 million tons, of which 60 percent was coal. The project site currently receives approximately three to four barges per week, which supply about 95 percent of current plant operational material. The site has two docking facilities that can each dock one barge at a time. One is designed for operational deliveries and one for construction material deliveries.

3.13.4 Aviation

Because of its location near the greater Cincinnati airport, the Federal Aviation Administration regulates the heights of structures at Spurlock Station. The existing smoke stacks for Units 1 and 2 were built to the maximum height allowed, 805 feet (246 meters) aboveground level.

TABLE 3.13-1.—Traffic Levels for Main Roads Potentially Affected by the Project

Highway Number	County	Beginning MP	Ending MP	Actual Count	Year	Estimated Count, 2001
<i>Maysville to Cincinnati</i>						
8	Mason	7.6	11.0	1,280	2000	1,400
1597	Mason	0.0	1.9	242	1998	260
3056	Mason	2.8	3.5	917	1995	1,280
3056	Mason	3.5	7.8	724	1995	418
9	Mason	13.8	14.0	10,067	1998	12,000
9	Mason	14.0	14.9	5,945	1998	7,070
9	Mason	14.9	17.2	5,202	1998	6,210
9	Mason	17.2	17.4	4,873	1998	6,140
9	Bracken	0.0	5.5	4,873	1998	6,140
9	Bracken	5.5	9.4	6,243	1997	9,240
9	Bracken	9.4	10.3	6,132	1998	7,970
9	Bracken	10.3	13.6	5,483	1996	8,630
9	Bracken	13.6	19.9	7,419	1998	9,490
9	Pendleton	0.0	4.3	7,193	1999	8,060
9	Campbell	0.0	0.7	7,639	1999	9,200
9	Campbell	0.7	4.2	6,720	1996	9,510
9	Campbell	4.2	8.0	11,495	2001	N/A
9	Campbell	8.0	11.6	13,045	1999	14,100
9	Campbell	11.6	12.4	8,230	1991	9,580
9	Campbell	12.4	15.9	20,656	2001	N/A
9	Campbell	15.9	18.0	25,159	1998	29,600

Construction Routes

8	Mason	0.0	1.3	916	2000	942
8	Mason	1.3	3.4	1,207	1994	1,360
8	Mason	3.4	7.6	920	1995	1,170
8	Mason	7.6	11.0	1,281	2000	1,400
8	Mason	11.0	11.3	4,210	2000	3,780
8	Mason	11.3	11.5	3,529	1999	3,260
8	Mason	11.5	11.8	4,956	1999	4,400
8	Mason	11.8	11.9	3,361	2000	3,310
8	Mason	11.9	12.1	2,847	1999	2,730
8	Mason	12.1	12.3	6,751	1998	6,350
10	Mason	3.8	4.1	9,925	2000	9,830
10	Mason	4.1	4.2	8,898	1999	8,830
10	Mason	4.2	4.7	10,918	1999	10,800
10	Mason	4.7	5.1	7,605	1999	7,310
10	Mason	5.1	5.4	4,450	1999	4,220
10	Mason	5.4	6.2	4,990	1998	5,350
10	Mason	6.2	6.5	2,375	1999	2,360
10	Mason	6.5	10.0	1,727	1995	1,050
10	Mason	10.0	13.3	1,431	1999	1,370

Source: CTS 2001.

TABLE 3.13-2.—Greenup Locks and Dam Tonnage and Commodity Distribution, 1999.

Commodity	Tonnage	Percent	Value (Millions)	Percent
Coal	42,796,499	60.0	\$1,662	17.1
Petroleum	7,419,150	10.0	\$1,145	11.8
Aggregates	6,713,639	9.0	\$ 439	4.5
Grains	65,006	0.1	\$ 12	0.1
Chemicals	3,516,549	5.0	\$1,395	14.3
Ores/Minerals	2,803,109	4.0	\$ 341	3.5
Iron/Steel	5,488,555	7.9	\$2,797	28.7
Other	2,847,600	4.0	\$1,946	20.0
Total	71,650,107		\$9,738	

Source: USACE 2001.

4.0 ENVIRONMENTAL EFFECTS

4.1 AIR QUALITY AND NOISE

This section discusses the potential air quality and noise impacts of the Proposed Action and alternatives in the vicinity of the project. The methodology for determining impacts is presented, along with a description of the construction and operation impacts for each alternative.

4.1.1 Air Quality

Methodology

The air quality resource impact analysis consists of evaluating the impacts of criteria and Hazardous Air Pollutant (HAP) concentrations resulting from construction and operation of Gilbert Unit 3 and associated material handling and control equipment. A PSD analysis to evaluate the air quality impacts from Unit 4 and its associated material handling and control equipment is currently underway and will be reviewed by the Kentucky Division of Air Quality. If the analysis shows that the additional air emissions from Unit 4 would meet PSD requirements protective of air quality within the region, then EKPC would be issued a PSD permit. A PSD permit is required before construction can begin on Unit 4. The analysis of Gilbert Unit 3 is accomplished by using the EPA-recommended Industrial Source Complex Short Term air quality dispersion model (ISCST3) to estimate pollutant concentrations and visibility impacts at receptors located within the area of potential effect. Pollutant concentrations and visibility impacts are then compared with Federal and state air quality standards adopted to protect human health and public welfare. Refer to Section 3.1 for a discussion of the PSD review required for new major or modified sources.

The area analyzed for potential air quality effects resulting from operation of the Proposed Action for criteria and HAP concentrations is a 19 by 19 mile (31 by 31 kilometer) grid centered approximately on the Spurlock Station. The area of potential effects for visibility and/or acid deposition impacts includes the designated Class I airsheds at Mammoth Caves National Park located 150 miles (250 kilometer) southwest of the proposed project, and Great Smoky Mountains National Park located 198 miles (325 kilometer) south of the proposed project. Construction-generated air quality effects from fugitive dust and construction equipment would be limited to the immediate vicinity of Spurlock Station and the proposed transmission line right-of-way extending into Brown County, Ohio.

The decision as to whether an air quality impact from project operation is significant is determined by adding the maximum modeled air pollutant concentration from the proposed project and other existing sources in the area to the background air pollutant concentration for the respective pollutant. The resulting total is then compared with Federal and state air quality standards. In addition, the emissions from the proposed project and other sources in the area are modeled and compared to the allowable increases specified by the PSD increment. The significance of the impacts is assessed in terms of the percentage of the increment consumed. Impacts to air quality related values such as visibility are evaluated for the nearest Class I airsheds to the Spurlock Station. A 5-percent change in extinction (reduction of visibility) is

considered a significant impact. Data used for the air impacts analysis comes from the PSD permit application for the addition of Gilbert Unit 3 (Kenvirons 2001). The PSD permit application is currently under review by the Kentucky Division for Air Quality.

The significance of the construction air quality impacts is evaluated based on the projected construction progression, local climate and soil conditions, and land use adjacent to the project area. Mitigation measures to avoid potential nuisance dust conditions and minimize construction equipment impacts to nearby residents are described.

4.1.1.1 Construction

Proposed Action

The potential for effects on air quality during construction would be from fugitive dust and construction equipment exhaust. Fugitive dust emissions (dust which escapes from a construction site) could result from the construction and staging areas at the Spurlock Station and along the proposed transmission line right-of-way extending into Brown County. The total area disturbed for construction of Gilbert Unit 3 and associated cooling towers would be approximately 1 acre (0.4 hectares). The active area along the 3.5-mile (5.6-kilometer) long transmission right-of-way would be 150 feet (46 meters) wide. The major sources of dust emissions would be construction equipment traffic, land clearing, drilling, excavation, and earth moving. EKPC does not anticipate any blasting operations. Dust emissions would vary substantially from day to day, depending on the level of activity, the specific operation, and the prevailing meteorological conditions.

The use of construction equipment would also result in the emission of air pollutants associated with diesel combustion (NO_x , CO, SO_x , PM_{10} , and reactive organic gases from the fuel). As part of the mitigation of transmission line construction impacts, all construction vehicle movements would be limited to the pre-designated staging areas at the Spurlock Station, and to the right-of-way or public roads along the transmission line. Roads and active areas would have watering requirements appropriate for dust control for the season and region. It is not expected that permits concerning dust control would be required.

Outside of the main Spurlock Station plant area, the proposed project area consists of primarily agricultural and undeveloped land. A limited number of residents in the vicinity of the proposed construction may be affected by a temporary adverse impact on their local air quality during construction from fugitive dust. However, EKPC would implement dust control measures such as watering to minimize further dust generation. Construction of Gilbert Unit 3 would be completed within 29 months. Given that the construction is temporary and the adjacent land is primarily undeveloped, no significant impacts are expected to occur from construction. No construction related air quality impact would occur at any Class I Areas.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. However, ongoing

construction of the selective catalytic reduction for Units 1 and 2 would continue. Air quality impacts from the selective catalytic reduction construction are similar to those construction impacts described above for the Proposed Action. Construction of the selective catalytic reduction for Units 1 and 2 is expected to be completed by fall of 2002.

4.1.1.2 Operation

Proposed Action

To assess the potential air quality impacts of the operation of Gilbert Unit 3 and associated material handling and control equipment, the EPA-recommended ISCST3 air quality dispersion model is used to estimate pollutant concentrations and visibility impacts at receptors located within the area of potential effect, as required for PSD review. Data inputs for the model include emissions information, source parameters, a receptor grid, and meteorological information. The setup and results of the model runs are described below. An initial screening run of the model identified pollutants with the potential to have a significant impact, as defined in PSD regulations. Three sets of further refined modeling runs were used to assess the following: (1) Pre-construction monitoring requirements, (2) Class II increment analyses, and (3) NAAQS and state air quality standard analyses.

Proposed Equipment. The Proposed Action involves the addition of a 268 MW coal-fired CFB boiler powering a steam-turbine generator, along with associated emission control equipment, and coal, ash, and limestone handling facilities. In a CFB boiler, combustion occurs when coal, together with ash, and in this case limestone, are suspended through the action of primary combustion air distributed below the combustion floor. A CFB boiler design, when operated in conjunction with limestone in the combustion process, functions to significantly remove SO₂ from its emissions. An add-on dry lime scrubbing unit is also being proposed to allow the plant to combust higher-sulfur Western Kentucky coal without increasing emissions of SO₂ or H₂SO₄ (sulfuric acid) above levels that represent Best Available Control Technology (BACT), as described in Section 3.1.1. Selective Non-Catalytic Reduction is being proposed as the add-on control measure to limit emissions of NO_x to BACT levels. Control of combustion parameters such as air flow and temperature would also control NO_x and CO to BACT levels. Particulate emissions (PM₁₀) from the boiler would be controlled to BACT levels by means of a single pulse jet-type fabric filter with multiple compartments.

The proposed project also includes plans for the construction of a stack for dispersing controlled emissions from the boiler. The stack dimensions are proposed to be approximately 720 feet (220 meters) high by 16 feet (4.8 meters) inner diameter. The stack would be constructed with a reinforced concrete shell enclosing a steel liner. Plant heat rejection would be accomplished by a new mechanical draft cooling tower, the primary point of release for visible steam emissions from the plant.

The existing coal conveying system that transfers coal from the storage pile to the crushers and into storage silos before conveyance to the boiler would be utilized for Gilbert Unit 3 and would be expanded to accommodate the coal for Unit 4. In addition, handling and conveyance systems

for limestone and ash would be added. Baghouses and wet suppression spray systems are proposed to meet BACT PM₁₀ emission limits from coal, limestone, and ash handling.

Determination of Potential Emissions. The projected emissions increase from Gilbert Unit 3, including emissions increases from existing facilities (for example, due to increased throughput of the coal handling facilities), was calculated for each pollutant. The maximum annual potential to emit for each pollutant was calculated based on equipment manufacturer guarantees, assuming a nominal firing rate of 2,500 mmBTU/hr and 8,760 hours of operation per year (24 hours per day, 365 days per year). For pollutants where there is no manufacturer guarantee, emission factors were used from EPA's *AP-42 Compilation of Air Pollutant Emission Factors, Volume 1, Fifth Edition* (AP-42). Table 4.1–1 lists the potential criteria pollutant emissions from the proposed Gilbert Unit 3 CFB boiler on an hourly and annual basis.

TABLE 4.1–1.—Gilbert Unit 3 CFB Boiler Estimated Controlled Criteria Pollutant Emissions

Pollutant	Average Hourly Emissions (lbs/hr)	Annual Total (tons/year)
NO _x	250.00	1095.00
CO	375.00	1642.50
PM ₁₀	75.00	328.50
SO ₂	500.00	2190.00
VOC	9.00	39.42
H ₂ SO ₄ mist	12.50	54.75
Particulate Flourides ¹	0.12	0.51
Lead ¹	0.0066	0.029
Beryllium ¹	0.00199	0.009
Mercury ¹	0.00664	0.029

¹ These trace elements are included in the list of PSD regulated pollutants, although they are not criteria pollutants.
Source: Kenviron 2001.

Table 4.1–2 summarizes the net increase in annual emissions for each of the criteria pollutants for the addition of Gilbert Unit 3. The PSD review requirements apply to major sources and modifications for pollutants with an increase that would exceed PSD significant emission rates. The table shows that the PSD significant emission rates would be exceeded for PM₁₀, SO₂, NO_x, CO, and H₂SO₄ mist. Therefore, the requirements to demonstrate BACT and to evaluate air quality, Class I and secondary impacts apply for each of these five pollutants. Net increases of volatile organic compounds and particulate fluorides are below the PSD significant emission rates therefore, no further analysis of volatile organic compounds or fluoride emissions is required by the PSD regulations for the addition of Gilbert Unit 3. A separate PSD analysis will be performed for the addition of Unit 4 in accordance with the PSD and NEPA regulations.

Note that the calculation of emissions for PSD review requirements does not include engine exhaust emissions from vehicles (for example, ash haul trucks). However, based on typical emissions of off-road trucks as estimated by EPA in AP-42, the emissions from the increased trucks associated with the proposed project would be less than 1 percent of the project emissions listed in Table 4.1–2. Therefore, increased truck emissions would not significantly affect the model results described below.

Source Parameters. The ISCST3 dispersion model requires input of source data defining the physical attributes of the modeled emissions points. These attributes include Universal Transverse Mercator coordinates of stack location, and stack height, temperature, gas velocity, and diameter. For the CFB boiler, manufacturer design equipment specifications were the primary source for determining the source parameters.

TABLE 4.1-2.—Net Increase in Annual Emissions for Gilbert Unit 3¹

Emissions Source	<i>Potential Criteria Pollutant Emission Increases, tons/year</i>						
	PM ₁₀	SO ₂	NO _x	CO	VOC	H ₂ SO ₄ mist	Fluorides
New CFB Boiler	328.50	2190.00	1095.00	1642.50	39.42	54.75	0.51
Coal Crusher House	0.44	-	-	-	-	-	-
Coal Pile Unloading	0.99	-	-	-	-	-	-
Coal Silos	0.44	-	-	-	-	-	-
Existing Coal Transfer Tower	0.16	-	-	-	-	-	-
New Coal Transfer Tower	0.16	-	-	-	-	-	-
Bed Ash Silo	6.57	-	-	-	-	-	-
Fly Ash Silo	2.19	-	-	-	-	-	-
Limestone Preparation	0.44	-	-	-	-	-	-
Lime Silo	3.75	-	-	-	-	-	-
Limestone Truck Unloading	0.002	-	-	-	-	-	-
Cooling Tower	2.98	-	-	-	-	-	-
Total Emissions Increase	346.77	2190.00	1095.00	1642.50	39.42	54.75	0.51
PSD Significant Level	15	40	40	100	40	7	3
Emissions Increase Exceeds PSD	yes	yes	yes	yes	no	yes	no
Significant Emission Rate?							

¹ This Table only includes proposed emission increases associated with the addition of Gilbert Unit 3.
Source: Kenviros 2001.

Receptor Grid. The receptors are the locations at which the ISCST3 model calculates concentrations for each of the pollutants. A receptor grid with 100-meter spacing was placed around the perimeter of Spurlock Station property boundary. For the initial screening run, additional receptors were located at 1,000-meter intervals on a 19 by 19 mile (31 by 31 kilometer) grid centered approximately on the Spurlock Station. Based on the initial screening model run, receptors were added at 100-meter intervals in the areas showing the highest potential air quality impacts.

Meteorological Data. Five years of data that accurately simulates meteorological conditions in the region were used. This data is comprised of surface data and upper air data. Surface data was obtained from the Cincinnati-Northern Kentucky Weather Station (approximately 50 miles [80 kilometers] northwest of the plant site) for the calendar years 1990 to 1994. No upper air station was located at the surface station, so the nearest available upper air station data were used. This station is located in Huntington, West Virginia. The same years of upper air data (1990 to 1994) were obtained from EPA and used for the modeling runs.

Model Assumptions. The EPA regulatory default ISCST3 model assumptions were used, as follows:

- Stack tip downwash
- Final plume rise
- Buoyancy induced dispersion
- Vertical potential gradient
- Calm processing
- COMPLEX1 terrain processing
- Wind Profile Exponents

Rural dispersion coefficients and simple terrain parameters were chosen based on EPA guidelines. Appropriate values were determined from review of six U.S. Geological Survey 7.5 minute topographic maps of the project area.

Model Results. An initial set of ISCST3 screening model runs was performed for the Gilbert Unit 3 emission increases using 5 years of meteorological data as input to estimate pollutant concentrations at receptor grid locations. This PSD modeling was performed as required for all pollutants with PSD Significant Emission Rates. The maximum concentration of each pollutant over the 5 year modeled period gives a conservative (maximum) estimate of the peak pollutant concentrations from the proposed project. Based on the screening model runs, maximum impacts of NO_x and CO, for all averaging periods, as well as annual impacts of SO₂ and PM₁₀, were found to be well below the PSD significant impact levels and thus would not have the potential to cause or contribute to an increment or NAAQS violation. (Air quality standards such as the NAAQS define the allowable average pollutant concentration over a given time period, or averaging period.) Likewise, beryllium, mercury, and H₂SO₄ mist were found to be less than PSD de minimis levels. Therefore, no further refined modeling analysis for these pollutants and averaging periods is required for Gilbert Unit 3. SO₂ (3-hour and 24-hour average) and PM₁₀ (24-hour average) were identified as the only pollutants for which a significant off-property impact is predicted to occur. Therefore, a set of refined model runs was performed to compare the potential impacts to the NAAQS and Class II increment for SO₂ and PM₁₀, as described below.

Preconstruction Monitoring Analyses. The first set of refined modeling runs for SO₂ and PM₁₀ examined only the emissions increases from Gilbert Unit 3 to determine if pre-construction monitoring of ambient pollutant levels at the Spurlock Station would be required. The modeling focused on significant impact areas with refined 100-meter receptor grids for each pollutant, shown in Figures 4.1–1 and 4.1–2. The modeling showed that the predicted maximum concentrations are less than the PSD de minimis levels, and thus no preconstruction monitoring is required for Gilbert Unit 3.

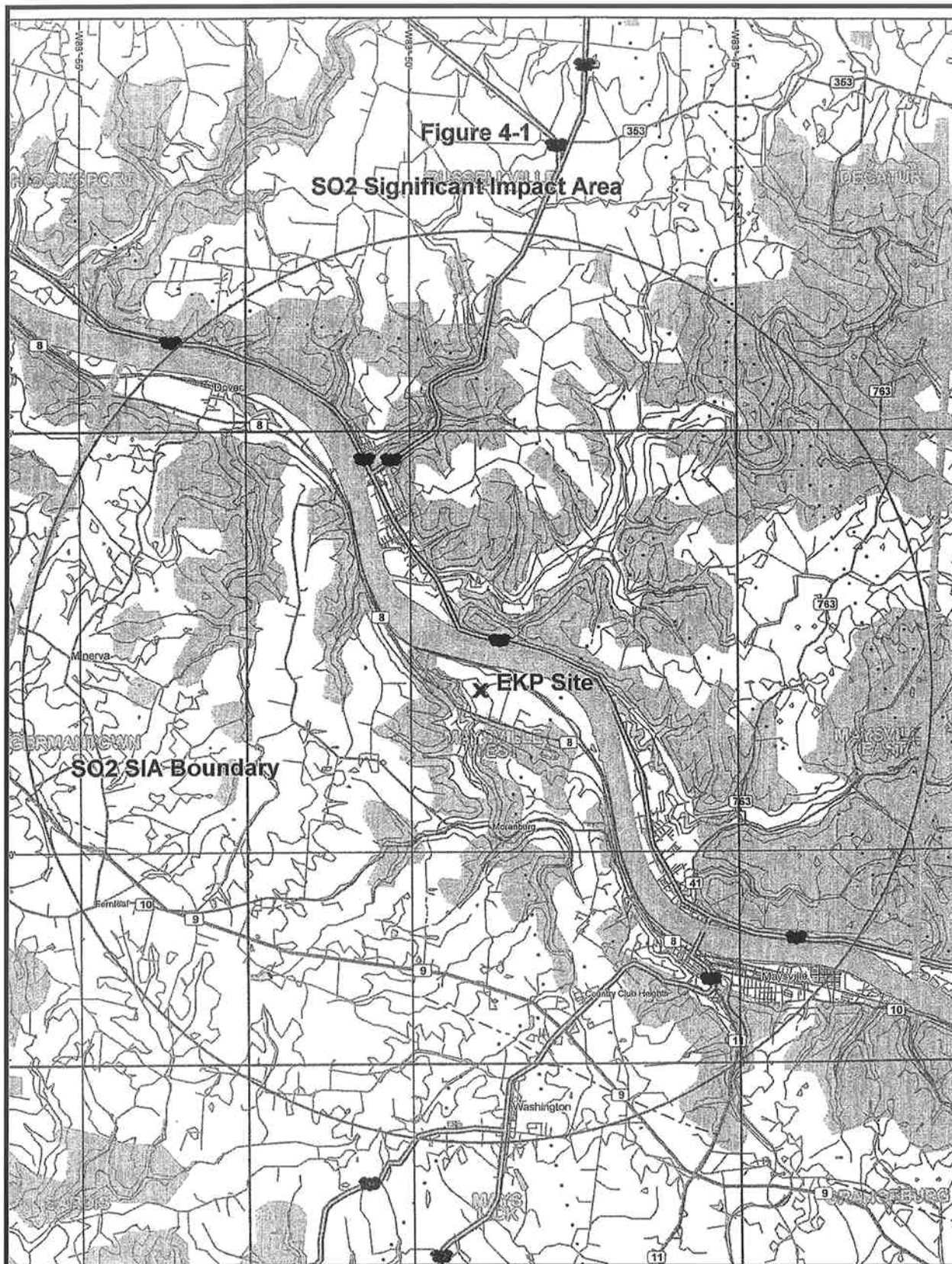


FIGURE 4.1-1.—SO₂ Significant Impact Area for Gilbert Unit 3.

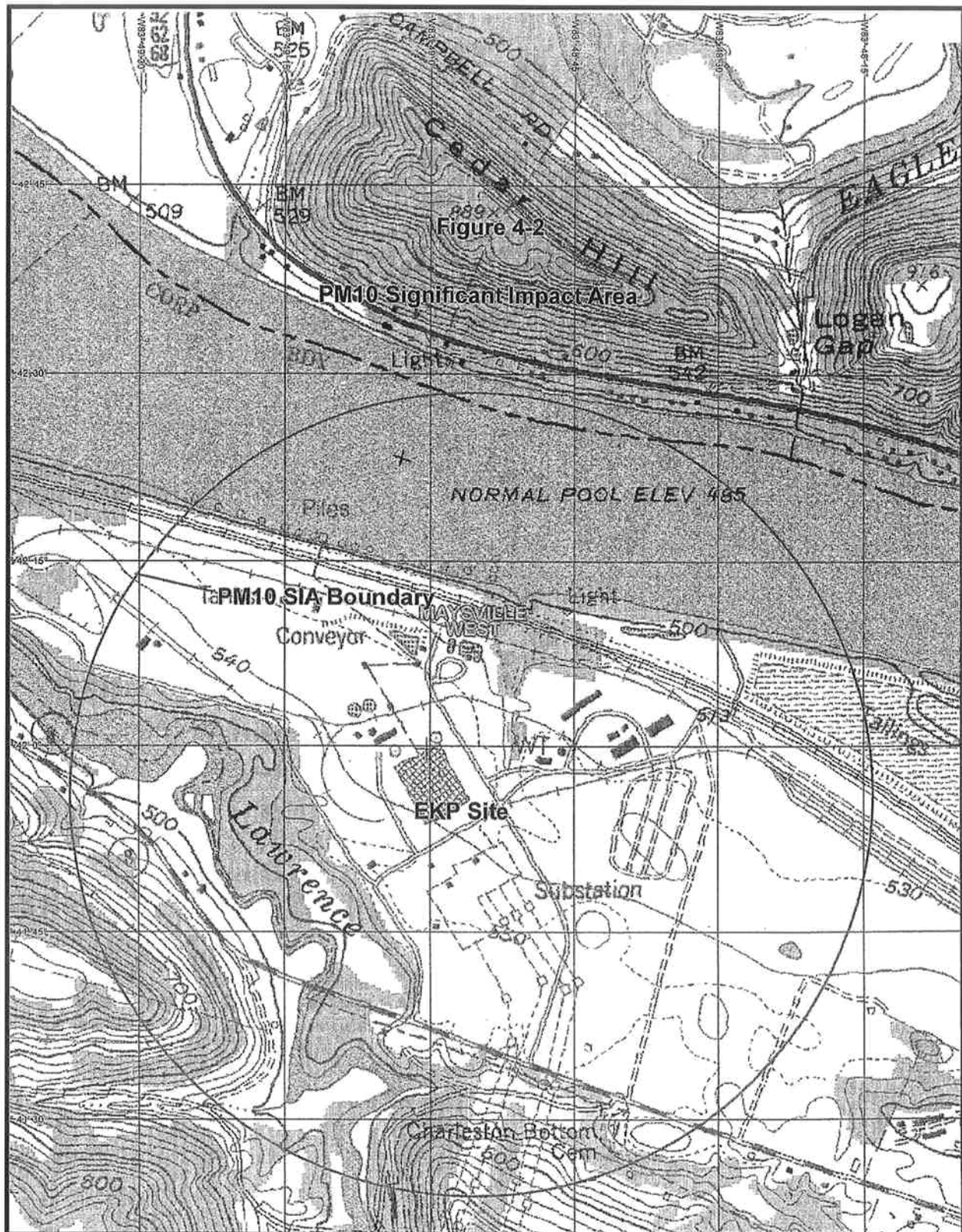


FIGURE 4.1-2.—PM₁₀ Significant Impact Area for Gilbert Unit 3.

Increment Consumption Analyses. The second set of refined modeling runs included the impacts of emissions from specific sources in the project area to ensure emission increases in the area would not exceed the amount specified by the PSD Class II increment. The concept of the increment is that air quality should not be allowed to degrade right up to the level of the NAAQS; instead, air quality should be preserved to stay within a range (increment) of the air quality as it existed on the baseline date when increments were first established in the 1970s. The Class I increment provides special protection to parks and wilderness areas; the Class II increment is the standard that applies for areas outside Class I. Thus, increment-consuming sources included in the increment modeling analyses were those minor and major sources constructed after the establishment of the baseline date.

Table 4.1–3 shows the results of the increment consumption analyses for both SO₂ and PM₁₀ over 5 years of meteorological data. This table shows that the maximum 3-hour SO₂ increment consumption impact is 174.12 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), which represents 34.0 percent of the 3-hour SO₂ increment. The maximum 24-hour increment consumption impact is 38.43 $\mu\text{g}/\text{m}^3$, which represents 42.2 percent of the available increment standard for this averaging time. The maximum 24-hour PM₁₀ increment consumption impact is 16.62 $\mu\text{g}/\text{m}^3$, which represents 55.4 percent of the available increment for this pollutant. Figure 4.1–3 depicts the location of the maximum increment consumption impacts. Based on this detailed modeling analysis of all increment-consuming sources of PM₁₀ and SO₂, the proposed new Gilbert Unit 3 boiler would not cause or contribute to any exceedance of the applicable PSD increment standards.

**TABLE 4.1–3.—Gilbert Unit 3 Increment Consumption Analysis
(all increment-consuming sources)**

Pollutant	Averaging Time	Year Showing Maximum Impact	Maximum Impact ($\mu\text{g}/\text{m}^3$)	Increment Standard ($\mu\text{g}/\text{m}^3$)	Percent of Increment Consumed
SO ₂	3-hour	1994	174.12	512	34.0 %
	24-hour	1993	38.43	91	42.2 %
PM ₁₀	24-hour	1992	16.62	30	55.4 %

Source: Kenvirons 2001.

NAAQS Analyses. The third set of refined modeling evaluated if the proposed addition of Gilbert Unit 3, in combination with all other sources in the area, has the potential to cause or contribute to a violation of the NAAQS or state air quality standards. The sources included in this modeling run were as follows: (1) all sources of PM₁₀ and SO₂ associated with the addition of Gilbert Unit 3, (2) all PM₁₀ and SO₂ sources within the proposed project's significant impact areas, and (3) all sources expected to have a significant impact within the proposed project's significant impact areas. The NAAQS analyses is designed to look cumulatively at the impact of all significant emissions sources in the area. Based on review of emissions inventory data for the area, this included 9 sources in Kentucky and 18 sources in Ohio. The NAAQS analyses modeling was performed for the pollutants and averaging times (3-hour and 24-hour averages for SO₂, 24-hour average for PM₁₀) found to potentially have a significant impact. For comparison with the NAAQS, the highest modeled results over 5 years of meteorological data were added to the highest measured background concentration to assure conservative analysis of impacts.

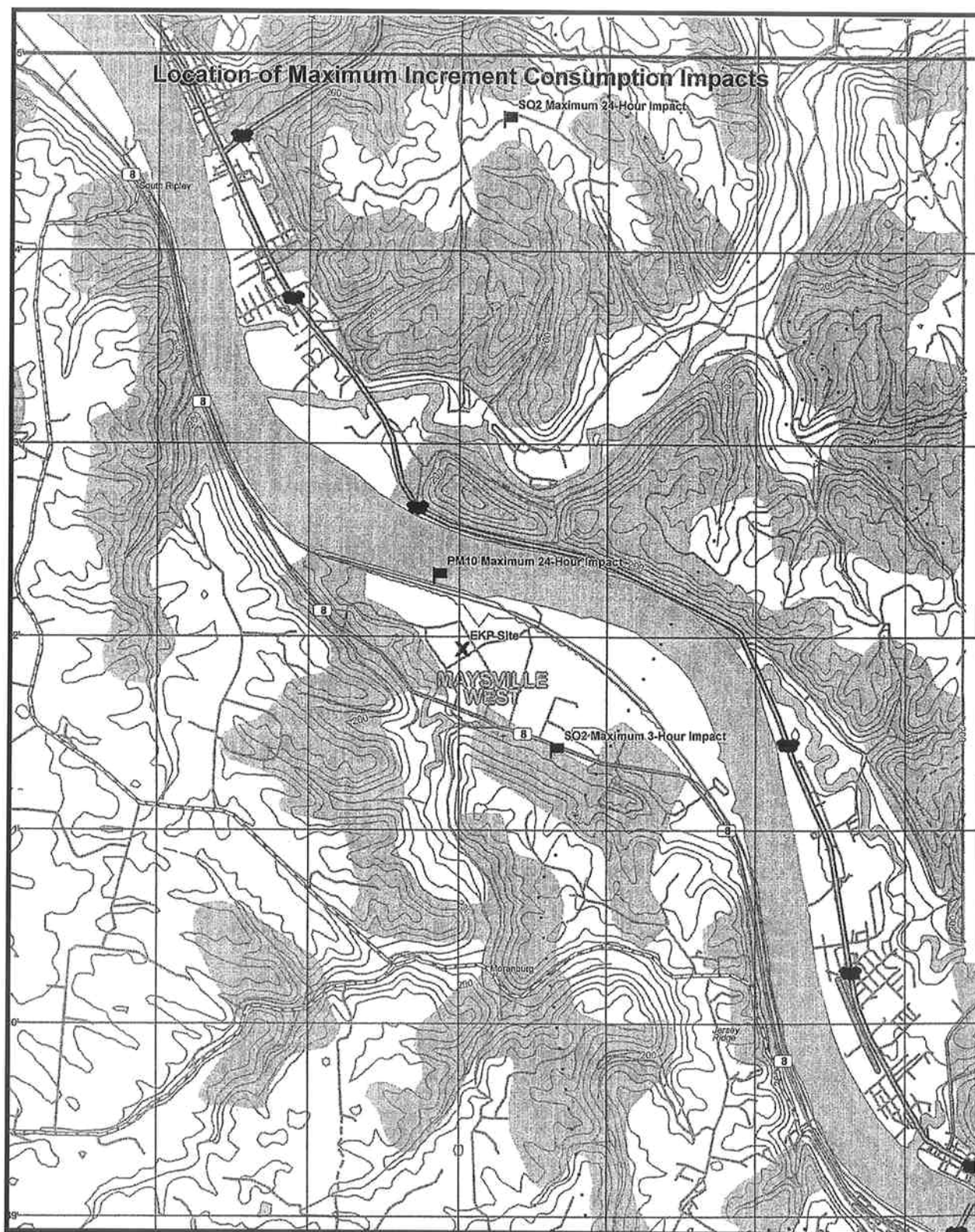


FIGURE 4.1-3.—Location of Maximum Increment Consumption Impacts for Gilbert Unit 3.

Table 4.1–4 presents the maximum ambient impacts of Gilbert Unit 3 for comparison with the NAAQS. The table shows that the maximum second-highest 24-hour total SO₂ impact (designated for PSD comparison with the NAAQS) from all modeled and background sources is predicted to be 302.27 µg/m³; this is less than the applicable NAAQS of 365 µg/m³. The maximum second-highest 3-hour total SO₂ impact is predicted to be 989.34 µg/m³, which is also less than the applicable NAAQS of 1,300 µg/m³. Finally, the total ambient concentration of PM₁₀ based upon the 24-hour second-highest modeled impact and background sources is predicted to be 109.21 µg/m³, which is less than the NAAQS of 150 µg/m³.

TABLE 4.1–4.—Gilbert Unit 3 Maximum Air Quality Impacts

Pollutant	Averaging Period	NAAQS (µg/m ³)	Maximum Impact Concentration (µg/m ³)	Background Concentration (µg/m ³)	Maximum Total Concentration (µg/m ³)	Percent of Ambient Air Quality Standard (NAAQS)
SO ₂	3-hour	1,300	813.06	177.6	990.66	76 %
	24-hour	365	182.97	119.3	302.27	83 %
PM ₁₀	24-hour	150	55.21	54	109.21	73 %

Source: Kenvirons 2001.

Hazardous Air Pollutants. The proposed addition of Gilbert Unit 3 would qualify as a major source for Hazardous Air Pollutants (HAPs) under Section 112 of the *Clean Air Act*, as amended. HAPs are pollutants known or suspected to cause cancer or other serious health effects. Table 4.1–5 lists potential emissions of all regulated HAPs that would be emitted by the proposed Gilbert Unit 3. Section 112 requires new major sources of HAPs to have emission limits that represent the Maximum Achievable Control Technology, based on emissions levels that are already being achieved by the better-controlled and lower-emitting sources in an industry. A separate HAPs analysis under Section 112 of the *Clean Air Act* will be performed for Unit 4 in accordance with the NEPA requirements.

The proposed control of organic HAPs to Maximum Achievable Control Technology levels from Gilbert Unit 3 relies on proper boiler design and operation. Calculation of the organic HAP emissions for the proposed project were performed using EPA's *Study of Hazardous Air Pollutant Emissions from Electric Utility Steam Generating Units- Final Report to Congress*. Factors for Eastern Kentucky bituminous coal were selected as appropriate for the coal used at Spurlock Station. Control of inorganic HAPs is proposed to be through the main Gilbert Unit 3 baghouse that also controls particulate (PM₁₀) emissions. Control of acid gases, HF and HCl, is proposed to be by limestone injection and fabric filtration to stay below Maximum Achievable Control Technology levels.

Class I Area Impacts. PSD regulations require an evaluation of the proposed project's potential impact on Class I areas (National Parks, wilderness areas, and other areas provided special air quality protection). The analysis must evaluate increment consumption for any significant increase in PM₁₀, SO₂, or NO_x emissions due to the construction or modification of a major source. Deposition of total sulfur and nitrogen (a measure of acid deposition), along with

TABLE 4.1-5.—Potential Hazardous Air Pollutant Emissions from Gilbert Unit 3¹

Pollutant	Emission Factor	Units	Baghouse EMF	Conc. (ppmw)	Cleaning factor	Emission Rate lbs/ hr	Emission Rate tons/ year
ORGANIC HAPS							
1, 1, 2-trichloroethane	4.7	lb/10 ¹² BTU	-	-	-	0.0118	0.051
2-chloroacetophenone	0.29	lb/10 ¹² BTU	-	-	-	0.0007	0.003
2,4-dinitrotoluene	0.015	lb/10 ¹² BTU	-	-	-	0.0000	0.000
Acetaldehyde	6.75	lb/10 ¹² BTU	-	-	-	0.0169	0.074
Acetophenone	0.68	lb/10 ¹² BTU	-	-	-	0.0017	0.007
Acrolein	3.25	lb/10 ¹² BTU	-	-	-	0.0081	0.036
Benzene	2.5	lb/10 ¹² BTU	-	-	-	0.0063	0.027
Benzyl chloride	0.006	lb/10 ¹² BTU	-	-	-	0.0000	0.000
Bis(2-ethylhexyl) phthalate	4.1	lb/10 ¹² BTU	-	-	-	0.0103	0.045
Bromoform	6.6	lb/10 ¹² BTU	-	-	-	0.0165	0.072
Carbon disulfide	4.3	lb/10 ¹² BTU	-	-	-	0.0108	0.047
Carbon tetrachloride	3.25	lb/10 ¹² BTU	-	-	-	0.0081	0.036
Chlorobenzene	3.18	lb/10 ¹² BTU	-	-	-	0.0080	0.035
Chloroform	3.2	lb/10 ¹² BTU	-	-	-	0.0080	0.035
Cumene	0.29	lb/10 ¹² BTU	-	-	-	0.0007	0.003
Dibutyl phthalate	2.8	lb/10 ¹² BTU	-	-	-	0.0070	0.031
Ethyl benzene	0.41	lb/10 ¹² BTU	-	-	-	0.0010	0.004
Ethyl chloride	2.4	lb/10 ¹² BTU	-	-	-	0.0060	0.026
Methyl chloroform	3.42	lb/10 ¹² BTU	-	-	-	0.0086	0.037
Ethylene dichloride	3.1	lb/10 ¹² BTU	-	-	-	0.0078	0.034
Formaldehyde	4	lb/10 ¹² BTU	-	-	-	0.0100	0.044
Hexane	0.83	lb/10 ¹² BTU	-	-	-	0.0021	0.009
Hexachlorobenzene	0.06	lb/10 ¹² BTU	-	-	-	0.0002	0.001
Isophorone	24	lb/10 ¹² BTU	-	-	-	0.0600	0.263
Methyl bromide	0.89	lb/10 ¹² BTU	-	-	-	0.0022	0.010
Methyl chloride	5.9	lb/10 ¹² BTU	-	-	-	0.0148	0.065
Methyl ethyl ketone	8	lb/10 ¹² BTU	-	-	-	0.0200	0.088
Methyl iodine	0.4	lb/10 ¹² BTU	-	-	-	0.0010	0.004
Methyl isobutyl ketone	4.9	lb/10 ¹² BTU	-	-	-	0.0123	0.054
Methyl methacrylate	1.1	lb/10 ¹² BTU	-	-	-	0.0028	0.012
Methyl tert-butyl ether	1.4	lb/10 ¹² BTU	-	-	-	0.0035	0.015
Methylene chloride	13	lb/10 ¹² BTU	-	-	-	0.0325	0.142
n-nitrosodimethylamine	0.68	lb/10 ¹² BTU	-	-	-	0.0017	0.007
Naphthalene	0.77	lb/10 ¹² BTU	-	-	-	0.0019	0.008
m,p-cresol	0.675	lb/10 ¹² BTU	-	-	-	0.0017	0.007
o-cresol	1.7	lb/10 ¹² BTU	-	-	-	0.0043	0.019
p-cresol	0.95	lb/10 ¹² BTU	-	-	-	0.0024	0.010
Perylene	0.075	lb/10 ¹² BTU	-	-	-	0.0002	0.001
Pentachlorophenol	0.008	lb/10 ¹² BTU	-	-	-	0.0000	0.000
Phenol	6.1	lb/10 ¹² BTU	-	-	-	0.0153	0.067
Phthalic anhydride	4.9	lb/10 ¹² BTU	-	-	-	0.0123	0.054
Propionaldehyde	10.35	lb/10 ¹² BTU	-	-	-	0.0259	0.113
Quinoline	0.053	lb/10 ¹² BTU	-	-	-	0.0001	0.001
Styrene	3.1	lb/10 ¹² BTU	-	-	-	0.0078	0.034
Tetrachloroethylene	3.1	lb/10 ¹² BTU	-	-	-	0.0078	0.034
Toluene	3.6	lb/10 ¹² BTU	-	-	-	0.0090	0.039
Trans-1,3 dichloropropene	4.7	lb/10 ¹² BTU	-	-	-	0.0118	0.051
Trichloroethylene	3.1	lb/10 ¹² BTU	-	-	-	0.0078	0.034
Vinyl acetate	0.42	lb/10 ¹² BTU	-	-	-	0.0011	0.005
Vinylidene chloride	9.7	lb/10 ¹² BTU	-	-	-	0.0243	0.106
Xylenes	4.65	lb/10 ¹² BTU	-	-	-	0.0116	0.051
o-xylenes	0.81	lb/10 ¹² BTU	-	-	-	0.0020	0.009
m,p-xylenes	1.45	lb/10 ¹² BTU	-	-	-	0.0036	0.016
2,3,7,8-tetrachlorodi-benzo-p-dioxin	1.5E-06	lb/10 ¹² BTU	-	-	-	0.0000	1.64E-08
1,2,3,7,8-tetrachlorodi-benzo-p-dioxin	2.8E-06	lb/10 ¹² BTU	-	-	-	7.000E-09	3.07E-08
1,2,3,4,7,8-hexachlorodi-benzo-p-dioxin	5.9E-06	lb/10 ¹² BTU	-	-	-	1.475E-08	6.46E-08
1,2,3,6,7,8-hexachlorodi-benzo-p-dioxin	6.6E-06	lb/10 ¹² BTU	-	-	-	1.650E-08	7.23E-08
1,2,3,7,8,9-hexachlorodi-benzo-p-dioxin	7.9E-06	lb/10 ¹² BTU	-	-	-	1.975E-08	8.65E-08
1,2,3,4,6,7,8-heptachlorodi-benzo-p-dioxin	4.2E+00	lb/10 ¹² BTU	-	-	-	1.050E-02	4.60E-02

TABLE 4.1-5.—Potential Hazardous Air Pollutant Emissions from Gilbert Unit 3¹
(continued)

Pollutant	Emission Factor	Units	Baghouse EMF	Conc. (ppmw)	Cleaning factor	Emission Rate lbs/ hr	Emission Rate tons/ year
Heptachlorodi-benzo-p-dioxin	7.6E-05	lb/10 ¹² BTU	-	-	-	1.900E-07	8.32E-07
Hexachlorodi-benzo-p-dioxin	2.7E-05	lb/10 ¹² BTU	-	-	-	6.750E-08	2.96E-07
Octachlorodi-benzo-p-dioxin	3.6E-05	lb/10 ¹² BTU	-	-	-	9.000E-08	3.94E-07
Pentachlorodi-benzo-p-dioxin	8.0E-06	lb/10 ¹² BTU	-	-	-	2.000E-08	8.76E-08
Tetrachlorodi-benzo-p-dioxin	8.8E-06	lb/10 ¹² BTU	-	-	-	2.200E-08	9.64E-08
2,3,7,8-tetrachlorodi-benzofuran	4.4E-06	lb/10 ¹² BTU	-	-	-	1.100E-08	4.82E-08
1,2,3,7,8-pentachlorodi-benzofuran	4.6E-06	lb/10 ¹² BTU	-	-	-	1.150E-08	5.04E-08
2,3,4,7,8-pentachlorodi-benzofuran	4.8E-06	lb/10 ¹² BTU	-	-	-	1.200E-08	5.26E-08
1,2,3,4,7,8-hexachlorodi-benzofuran	7.9E-06	lb/10 ¹² BTU	-	-	-	1.975E-08	8.65E-08
1,2,3,6,7,8-hexachlorodi-benzofuran	4.0E-06	lb/10 ¹² BTU	-	-	-	1.000E-08	4.38E-08
1,2,3,7,8,9-hexachlorodi-benzofuran	6.8E-06	lb/10 ¹² BTU	-	-	-	1.700E-08	7.45E-08
2,3,4,6,7,8-hexachlorodi-benzofuran	1.2E-06	lb/10 ¹² BTU	-	-	-	3.000E-09	1.31E-08
1,2,3,4,6,7,8-heptachlorodi-benzofuran	5.7E-06	lb/10 ¹² BTU	-	-	-	1.425E-08	6.24E-08
1,2,3,4,7,8,9-heptachlorodi-benzofuran	1.8E-05	lb/10 ¹² BTU	-	-	-	4.500E-08	1.97E-07
Heptachlorodi-benzofuran	1.9E-05	lb/10 ¹² BTU	-	-	-	4.750E-08	2.08E-07
Hexachlorodi-benzofuran	2.1E-05	lb/10 ¹² BTU	-	-	-	5.250E-08	2.30E-07
Octachlorodi-benzofuran	1.7E-06	lb/10 ¹² BTU	-	-	-	4.250E-09	1.86E-08
Pentachlorodi-benzofuran	1.2E-05	lb/10 ¹² BTU	-	-	-	3.000E-08	1.31E-07
Tetrachlorodi-benzofuma	1.1E-05	lb/10 ¹² BTU	-	-	-	2.750E-08	1.20E-07
1-methylnaphthalene	0.01	lb/10 ¹² BTU	-	-	-	2.500E-05	1.10E-04
2-chloronaphthalene	0.04	lb/10 ¹² BTU	-	-	-	1.000E-04	4.38E-04
2-methylnaphthalene	0.032	lb/10 ¹² BTU	-	-	-	8.000E-05	3.50E-04
Acenaphthene	0.013	lb/10 ¹² BTU	-	-	-	3.250E-05	1.42E-04
Acenaphthylene	0.004	lb/10 ¹² BTU	-	-	-	1.000E-05	4.38E-05
Anthracene	0.004	lb/10 ¹² BTU	-	-	-	1.000E-05	4.38E-05
Benz(a)anthracene	0.002	lb/10 ¹² BTU	-	-	-	5.000E-06	2.19E-05
Benzo(a)pyrene	0.001	lb/10 ¹² BTU	-	-	-	2.500E-06	1.10E-05
Benzo(e)pyrene	0.001	lb/10 ¹² BTU	-	-	-	2.500E-06	1.10E-05
Benzo(b)fluoranthene	0.008	lb/10 ¹² BTU	-	-	-	2.000E-05	8.76E-05
Benzo(b+k)fluoranthene	0.004	lb/10 ¹² BTU	-	-	-	1.000E-05	4.38E-05
Benzo-(k)fluoranthene	0.004	lb/10 ¹² BTU	-	-	-	1.000E-05	4.38E-05
Benzo-(g,h,i)perylene	0.002	lb/10 ¹² BTU	-	-	-	5.000E-06	2.19E-05
Biphenyl	0.18	lb/10 ¹² BTU	-	-	-	4.500E-04	1.97E-03
Chrysene	0.003	lb/10 ¹² BTU	-	-	-	7.500E-06	3.29E-05
Dibenzo(a,h)anthracene	0.001	lb/10 ¹² BTU	-	-	-	2.500E-06	1.10E-05
Flouranthene	0.016	lb/10 ¹² BTU	-	-	-	4.000E-05	1.75E-04
Flourene	0.013	lb/10 ¹² BTU	-	-	-	3.250E-05	1.42E-04
Indeno(1,2,3-c,d)pyrene	0.003	lb/10 ¹² BTU	-	-	-	7.500E-06	3.29E-05
Phenanthrene	0.032	lb/10 ¹² BTU	-	-	-	8.000E-05	3.50E-04
Pyrene	0.012	lb/10 ¹² BTU	-	-	-	3.000E-05	1.31E-04
Total Organic HAPs							2.03
INORGANIC HAPS							
Antimony	1	ppmw	0.02	1.13	0.715	4.04E-03	0.018
Arsenic	0.77	ppmw	0.01	19.1	0.554	2.04E-02	0.089
Beryllium	0.56	ppmw	0.01	2.00	0.711	1.99E-03	0.009
Hydrogen chloride	1	ppmw	0.56	694.79	0.496	4.82E+01	211.318
Hydrogen fluoride	1	ppmw	1	52.64	0.496	6.53E+00	28.590
Cadmium	1	ppmw	0.08	0.16	0.624	2.00E-03	0.009
Chromium	0.46	ppmw	0.01	16.3	0.512	9.60E-03	0.042
Cobalt	1	ppmw	0.004	6.6	0.537	3.54E-03	0.016
Lead	0.42	ppmw	0.01	14.00	0.449	6.60E-03	0.029
Manganese	0.63	ppmw	0.01	32	0.382	1.93E-02	0.084
Mercury	1	ppmw	0.56	0.06	0.79	6.64E-03	0.029
Nickel	0.67	ppmw	0.01	17.50	0.568	1.66E-02	0.073
Selenium	0.84	ppmw	0.31	3.83	0.745	1.86E-01	0.814
Total Inorganic HAPs							241.12
Total Annual HAP Potential Emissions							243.147

¹Emissions were calculated using median emission factors for 2010 from EPA-453/R-98-004b for the organic HAPS. Inorganic HAP emissions were also calculated using EPA-453/R-98-004b factors for coal cleaning, baghouse control, and concentration for Kentucky bituminous coal.

visibility, must also be evaluated. The nearest Class I Areas to the Spurlock Station are Mammoth Cave National Park, approximately 155 miles (250 kilometers) to the southwest, and Great Smoky Mountains National Park, 202 miles (325 kilometers) south of the plant site. The required Class I analysis was performed for Gilbert Unit 3 and will be performed for Unit 4 separately in accordance with NEPA and PSD requirements.

Increment Consumption. At the recommendation of the Federal Land Managers and the National Park Service Office in Denver, Colorado, the CALPUFF modeling system was used. Source inputs and meteorological data for the CALPUFF model were similar to those previously described for the ISCST3 modeling. Based on the CALPUFF modeling results, none of the PSD significant impact levels would be exceeded. Therefore, no further modeling to demonstrate increment protection in Class I areas is required for the addition of Gilbert Unit 3.

Acid Deposition. Annual deposition values were used from the CALPUFF model for the Class I Area acid deposition assessment for Mammoth Cave National Park. These impacts are related to the dry and wet deposition of nitric acid, NO_3 , NO_x , SO_2 , and SO_4 . Model-predicted deposition values were compared to existing deposition rates in the park. The maximum predicted sulfur deposition rate from the new Gilbert Unit 3 would be 0.0067 kilograms per hectare (0.0059 pounds per acre), which results in a total increase of 0.085 percent over current sulfur deposition levels. The maximum predicted nitrogen deposition rate from Gilbert Unit 3 is 0.000719 kilograms per hectare (0.000639 pounds per acre), which results in a total increase of 0.0002 percent over current nitrogen deposition levels.

For the Great Smoky Mountains National Park acid deposition analysis, National Park Service personnel provided screening threshold deposition values to identify whether further modeling analysis is needed. The screening threshold for total sulfur is currently 0.005 kilograms per hectare, while the screening threshold for total nitrogen is currently 0.0014 kilograms per hectare (0.0012 pounds per acre) (KENVIRONS 2001). Based on the CALPUFF modeling results, sulfur and nitrogen deposition rates within the park boundaries were below the screening thresholds, so no further modeling assessment was performed.

Visibility. The visibility analysis performed for Gilbert Unit 3 was conducted using the CALPUFF modeling system in the screening mode with the same input parameters as described above. The resulting CALPUFF output was then run with the CALPOST post-processing program to calculate changes in extinction at Mammoth Cave and Smoky Mountains National Parks due to the proposed project. Table 4.1–6 shows that the maximum change in extinction for in-park receptors is below 5 percent. Therefore, according to the procedures developed by the Federal Land Managers (FLAG 2000), the proposed project would not have an adverse effect on visibility in the Class I Areas evaluated. EPA's VISCREEN model was used for evaluation of plume visual impacts as observed from a given vantage point within each park. Based on the VISCREEN model results, the proposed project will not adversely affect visual parameters in these Class I Areas.

Greenhouse Effects. Carbon dioxide (CO_2) is the dominant greenhouse gas emission product from coal-fired boiler systems. Quantities of other greenhouse gases (such as methane and nitrous oxide) are very small in comparison to CO_2 . CO_2 emissions from coal-fired boiler

systems are primarily a function of fuel carbon content, not combustion system design. Most of the carbon content of the fuel is released as CO₂, with small amounts remaining in the residual ash or released as CO, total organic gases, and organic components of particulate matter. Based on the use of Eastern Kentucky bituminous coal (assuming medium volatility), total emissions of CO₂ from Units 3 and 4 combined are estimated to be approximately 6,084,696 tons per year.

TABLE 4.1–6.—Assessment of Visibility Impacts from Gilbert Unit 3 CALPUFF Modeling Results

Year	Mammoth Cave			Smoky Mountains		
	Max. Change in Extinction All Receptors	Total Days with Extinction > 5.0 %	Max. Change in Extinction Park Receptors	Max. Change in Extinction All Receptors	Total Days with Extinction > 5.0 %	Max. Change in Extinction Park Receptors
1986	9.84%	2*	2.10%	7.81%	1**	1.54%
1987	7.21%	2*	4.59%	5.75%	1**	0.71%
1988	3.75%	0	1.01%	2.62%	0	0.84%
1989	4.50%	0	1.61%	3.24%	0	0.86%
1990	5.94%	1*	2.24%	3.82%	0	3.82%

* The reported occurrences of predicted changes in extinction of greater than 5 % are located at receptors on a part of the polar screening ring that do not pass through the park boundaries. The maximum change in extinction for all modeled years for receptors that are actually located within the park boundaries (Receptors 228 - 233) is 4.59 %.

** The reported occurrences of predicted changes in extinction of greater than 5 % are located at receptors on a part of the polar screening ring that do not pass through the park boundaries. The maximum change in extinction for all modeled years for receptors that are actually located within the park boundaries (Receptors 189 - 193) is 1.93 %.

Transmission Line Operation. No significant air impacts are expected from ongoing operation and maintenance of the proposed transmission line. An occasional maintenance vehicle would be required to perform maintenance activities. Where maintenance access roads are not required, restoration of the right-of-way to natural shrubby vegetation would mitigate any fugitive dust emissions.

Conclusions. A number of steps in the modeling protocols introduce conservatism into the modeling results, thus assuring the absolute maximum impacts are predicted or over-predicted. Maximum emission rates are used for all emission points, assuming the maximum firing rate and maximum annual hours of operation. The modeled maximum impacts are based on the worst-case meteorological conditions for impacts selected from the 5 years of data. The maximum modeled impact is added to the maximum background pollutant concentrations, although the weather conditions that produce the highest impacts often do not coincide with the weather producing the highest background concentrations. Thus, the maximum air quality impacts presented in Table 4.1–4 follow PSD Regulations to obtain absolute maximum predicted impacts. The modeling analyses performed show that the proposed addition of Gilbert Unit 3 and associated equipment will be well below PSD increment limits and ambient air quality standards (NAAQS). Additionally, no significant air quality impacts are expected to occur from

the addition of Gilbert Unit 3 in the Class I Areas nearest to Spurlock Station. A separate air quality analysis will be performed for Unit 4 in accordance with PSD and NEPA requirements.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. However, the selective catalytic reduction currently under construction for Units 1 and 2 would be operated once the ongoing construction is complete. The emissions given for Units 1 and 2 in Section 3.1 of the Affected Environment chapter would be reduced by approximately 5,612 tons (5,091 metric tons) of NO_x per year upon operation of the selective catalytic reduction.

4.1.2 Noise

This section discusses the potential noise impacts of the construction and operation of Units 3 and 4 at the Spurlock Station, and the transmission line extending into Brown County, Ohio. The methodology for determining impacts is presented below, followed by a description of the potential impacts.

Methodology

The noise impact analysis evaluates the potential noise levels generated during construction and operation of the proposed project, and identifies potential receptors (for example, residences) in the vicinity of the proposed project. The analysis includes quantification of projected noise levels, based on calculations of construction related noise and sound level measurements taken at various locations near Spurlock Station. The analysis also assesses the potential for corona effects from the transmission lines, generally described as a crackling or hissing sound.

As explained in Section 3.1.2, noise levels are measured in composite decibel (dB) value. The adjusted decibels (dBA) represent the human hearing response to sound for a single sound event. The average sound level over a complete 24-hour period is represented by the Day-Night Average Sound Level, often used for the evaluation of community noise effects.

For construction of the proposed project, the predicted peak noise level for a single sound event (for example, a pile being driven) was calculated for the nearest residences to the construction locations. Noise levels would be reduced for receptors further removed from the construction by approximately 6 dBA for each doubling of distance from the source. For example, a 75 dBA noise heard at 50 feet (15 meters) from the source would be reduced to 69 dBA at 100 feet (30 meters) away from the source (Canter 1977).

For ongoing operation of the proposed project, the Day-Night Average Sound Level best represents the predicted average community noise levels near the Spurlock Station. In determining the significance of the calculated Day-Night Average Sound Level, results for each alternative are compared to established standards. In 1974, the EPA identified noise levels that could be used to protect public health and welfare, including prevention of hearing damage, sleep disturbance, and communication disruption. Outdoor Day-Night Average Sound Level values of

55 dBA were identified as desirable to protect against activity interference and hearing loss in residential areas and at educational facilities.

The determination as to whether the impact of a single sound event (or series of single events) is significant is a qualitative assessment of the increase in noise level above background as experienced by receptors near the source. A subjective response to changes in sound levels based upon personal judgements of sound presented within a short timespan indicate that a change of +/-5 dBA may be quite noticeable, although changes that take place over a long period of time of this magnitude or greater may be “barely perceptible.” Changes in sound levels of +/-10 dBA within a short timespan may be perceived by humans as “dramatic” and changes in sound levels of +/-20 dBA within a short timespan may be perceived as “striking.” In qualitative terms, these types of changes in sound level could be considered significant (DOE 2001).

4.1.2.1 Construction

Proposed Action

The acoustical environment would be impacted during construction of the proposed project, both from activities at the Spurlock Station and along the transmission line extending into Brown County, Ohio. Construction activities would generate noise produced by heavy construction equipment and trucks. Piles would be driven on the Spurlock Station site. No explosive blasting is anticipated during construction. Construction noise levels would be variable and intermittent, as equipment is operated on an as-needed basis. Construction activities normally would be limited to daytime hours, and thus would not impact existing background noise levels at night. While relatively high peak noise levels in the range of 80 to 103 dBA would occur on the active construction sites, these noise levels would be temporary and the impact would be minimized given the distances to the limited development in the project area. Table 4.1–7 presents the peak noise levels (dBA) expected for a single sound event from various equipment during construction.

TABLE 4.1–7.—Peak Attenuated Noise Levels (dBA) Expected from Construction Equipment

Source	Peak Noise Level	Distance from Source						
		50 ft	100 ft	200 ft	400 ft	1,000 ft	1,700 ft	2,500 ft
Heavy Trucks	95	84-89	78-83	72-77	66-71	58-63	54-59	50-55
Dump trucks	108	88	82	76	70	62	58	54
Concrete mixer	108	85	79	73	67	59	55	51
Jackhammer	108	88	82	76	70	62	58	54
Scraper	93	80-89	74-82	68-77	60-71	54-63	50-59	46-55
Bulldozer	107	87-102	81-96	75-90	69-84	61-76	57-72	53-68
Generator	96	76	70	64	58	50	46	42
Crane	104	75-88	69-82	63-76	55-70	49-62	45-48	41-54
Loader	104	73-86	67-80	61-74	55-68	47-60	43-56	39-52
Grader	108	88-91	82-85	76-79	70-73	62-65	58-61	54-57
Pile driver	105	95	89	83	77	69	65	61
Forklift	100	95	89	83	77	69	65	61

Source: Golden et al. 1980.

The combined effect of several equipment types operating simultaneously is not represented by the sum of the individual noise levels, but rather is calculated based on the logarithmic scale of decibels (see explanation in Section 3.1.2). Table 4.1–8 presents the results of a sample calculation assuming a worst-case scenario of a bulldozer, pile driver, and scraper operating simultaneously.

TABLE 4.1–8.—Worst-Case Combined Peak Noise Level from Bulldozer, Pile Driver, and Scraper

	Distance from Source				
	50 feet	100 feet	200 feet	¼ mile	½ mile
Combined Peak Noise Level	103 dBA	97 dBA	91 dBA	74 dBA	68 dBA

Noise measurements taken in the vicinity of the Spurlock Station during current construction (unrelated to the proposed project) verify the calculated noise levels described above. A series of sound level measurements was taken along the south side of the Ohio River, approximately 0.25 mile (0.4 kilometer) from pile driving activities adjacent to the existing boiler units. These readings showed sound levels ranging from 56 to 72 dBA (EKPC 2001). Thus, the predicted peak noise level of 74 dBA shown in Table 4.1–8 for 0.25 miles (0.4 kilometers) from the source provides a conservative estimate of the peak noise levels expected during construction activities.

The noise impacts from construction at the Spurlock Station would primarily affect the residents along Highway 52 across the Ohio River to the northeast, located 0.75 miles (1.2 kilometers) or more from the proposed construction areas. Peak noise levels at a distance of 0.75 miles (1.2 kilometers) from the construction areas would be approximately 65 dBA. In addition, a limited number of residents along Highway 8 near the plant entrance may be affected by construction noise, with one residence approximately 0.25 miles (0.4 kilometers) from the proposed construction areas. The peak noise level at a distance of 0.25 miles (0.4 kilometer) from the construction areas would be approximately 74 dBA. An automobile passing at a distance of 20 feet (6 meters) would have a sound of approximately 74 dBA. Thus, the effect to the nearest residents to the construction noise would be similar to a passing car on the adjacent highways to the residences. These temporary and intermittent noise level increases may be perceived as dramatic or striking relative to background noise levels when no construction is occurring. In addition to residences, intermittent peak noise levels may be experienced at businesses and by boaters and other recreational participants along the Ohio River. Refer to Section 3.1.2 for a complete discussion of existing noise levels in the area.

In evaluating the potential for hearing damage (both Temporary Threshold Shift and Noise-induced Permanent Threshold Shift), the noise level and duration of exposure are considered. For example, Noise-induced Permanent Threshold Shift would be produced by unprotected exposures of 8 hours per day for several years to noise above 105 dBA. Similarly, Temporary Threshold Shift would be based on exposure to a steady noise level of 80 to 130 dBA, increasing with duration of exposure (Canter 1977). The intermittent peak construction noise levels would not approach the steady noise level conditions for an extended duration that could lead to Temporary Threshold Shift or Noise-induced Permanent Threshold Shift hearing damage.

Based upon the noise impacts analyses of construction of the proposed project, the primary effect of noise generated would probably be one of annoyance to the residents nearest to the right-of-way during the construction period. Construction workers who would be located closer to the noise sources and would experience longer exposure durations than the public would follow standard industry and Federal Occupational Safety and Health Administration procedures for hearing protection.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. However, ongoing construction of the selective catalytic reduction for Units 1 and 2 would continue. Noise impacts from the ongoing selective catalytic reduction construction are similar to those construction impacts described above for the Proposed Action. Construction of the selective catalytic reduction for Units 1 and 2 is expected to be completed by fall of 2002.

4.1.2.2 Operation

Proposed Action

Upon completion of construction, the potential for noise impacts along the transmission line right-of-way would be from two major sources: (1) corona effects from the transmission lines, generally characterized as a crackling or hissing noise, and (2) occasional maintenance vehicles. Corona is the electrical breakdown of air into charged particles caused by the electrical field at the surface of conductors. During dry weather conditions, audible noise from transmission lines is often lost in the background noise at locations beyond the edge of the right-of-way. Modern transmission lines are designed, constructed and maintained so that during dry conditions they will operate below the corona-inception voltage, meaning that the line will generate a minimum of corona-related noise. Sound level measurements taken during fair weather at existing 345-kV transmission lines indicate only a 2 to 3 dB difference between background noise levels and levels beneath the transmission lines (Meyer 2001b). In foul weather conditions, corona discharges can be produced by water droplets and fog. Given the distance of receptors from the right-of-way, the impact of corona-generated audible noise is not expected to be significant.

The potential for noise impacts associated with Units 3 and 4 at the Spurlock Station would be primarily from the following sources: (1) Operation of Unit 3 and 4 boilers, steam turbines, and control equipment, (2) increased barge or rail deliveries and handling of coal, (3) increased limestone truck deliveries and handling, and (4) increased landfill ash trucks. The noise from the first three listed sources would be focused in the vicinity of the existing boiler units, while noise from the landfill ash trucks would occur between the ash silos and the ash landfill.

Current noise levels near the plant entrance and across the Ohio River are in the range of 44 to 51 dBA, measure during periods with minimal highway traffic (EKPC 2001). Residences at these locations are along Highway 8 and Highway 52, respectively. Existing noise levels near these residences are dominated by intermittent highway traffic. The increase in ongoing operating noise from Units 3 and 4 and associated equipment would be less than 2 dB at the

nearest residences on Highway 8 and Highway 52. This change in the background noise level would be overshadowed by existing highway traffic, which currently causes fluctuations of up to 20 dBA (EKPC 2001).

Noise levels at residences along the highway, currently averaging approximately 63 dBA during periods of traffic, would increase due to additional delivery of limestone. Limestone delivery trucks would be limited to a 6-hour period during the daytime, 5 days per week. During these delivery times, approximately 14 trucks of limestone would be delivered to the Spurlock Station each hour, along Highway 8. Based on the average noise level of 80 dBA for a two-axle commercial truck (35 mph, at a distance of 20 feet [6 meters]), the hourly average traffic noise during delivery hours would increase from 63 dBA to 64 dBA (Canter 1977).

As a result of the Proposed Action, the number of ash truckloads per hour taken to the landfill would also increase. Currently, approximately three truckloads of ash per hour are taken to the landfill. For operation of Units 3 and 4, an additional nine truckloads per hour would occur. Ash trucks would operate 7 daytime hours per day, 7 days per week. Current noise levels on South Ripley Road adjacent to the landfill range from 42 to 65 dBA, with the higher values resulting from public traffic (non-EKPC) on South Ripley Road, and from farm equipment on adjacent agricultural land. The terrain of the land shields the landfill almost entirely from view from South Ripley Road, and likewise, the noise levels from the ash landfill trucks are significantly shielded. Thus, the additional ash landfill truck noise as heard on South Ripley Road would be at a level similar to existing noise levels from traffic and activities in the area.

Given the change in sound levels described above, the increase in the Day-Night Average Sound Level was calculated for operation of the proposed project (after construction is complete). Beyond the EKPC property line, the Day-Night Average Sound Level would increase by 2 to 3 dBA due to the proposed project. This increase would not be expected to be perceived as noticeable by nearby residents given that the change would be constant, and that existing intermittent noise peaks already exist in the area due to traffic on nearby roads.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. Noise levels would remain similar to those described in the Affected Environment chapter, Section 3.1.

4.2 GEOLOGY AND SOILS

Methodology

The geology and soil resource impact analysis consists of an evaluation of the effects generated by the construction and operation of the proposed project on specific geologic and soil resource attributes. Construction activities represent the principal means by which an effect to the geologic resource (e.g., limiting access to mineral or energy resources) and the soil resource (e.g., disruption of prime farmland soils) would occur. The principal element in assessing the effect on the geologic and soil resource is the amount and location of land disturbed during construction.

To determine if an action may cause a significant impact, both the context of the action and the intensity of the impact are considered. For actions such as those proposed, the context is the locally affected area and its significance depends on the effects in the local area. The intensity of the impact is primarily considered in terms of any unique characteristics of the area (e.g., mineral resources, prime farmland), and the degree to which the Proposed Action may adversely affect such unique resources.

Impact analysis on the geologic resource by the proposed project involves the evaluation of potential effects to critical geologic attributes such as access to mineral and energy resources, destruction of unique geologic features, and mass movement or ground shifting induced by the construction of the proposed facilities and transmission line. The impact analysis includes the analysis of hazards from large-scale geological conditions such as earthquakes and volcanism. These conditions tend to affect broad expanses of land and are not typically restricted to smaller discrete areas of land.

Impact analysis on the soil resource by the proposed project involves the evaluation of potential effects to specific soil attributes such as increasing the potential for erosion and compaction by construction activities. Unlike the large-scale geologic conditions discussed above, affects to the soil resources occur on small, discrete areas of land.

4.2.1 Construction

Proposed Action

Geology

Part of the proposed project, Units 3 and 4, their associated facilities and 1¼ mile (2 kilometers) of transmission line, would be constructed on the previously disturbed Spurlock Station, which had already been graded and leveled during the construction of Units 1 and 2 and associated facilities in the late 1970s and early 1980s. Spurlock Station is built on the geologic formations of the Quaternary Period that consist of clay, silt, sand and gravel in various combinations that form alluvium, glacial outwash and eolian and lacustrine deposits. The depth to limestone and shale bedrock for Units 1 and 2 were found in a 1975 subsurface investigation to range between 113 to 136 feet (34.4 to 41.4 meters) (D&M 1975). Taking that design parameter into account

during construction, the structures of Units 1 and 2 are supported on piles driven to bedrock with exceptions of the cooling tower foundations and other lightly loaded foundations, which are supported by slab or spread footings bearing on soil (SCI 2001). Another geotechnical subsurface investigation would be conducted for Units 3 and 4 and would be expected to produce the same results. The construction of Units 3 and 4 would therefore likely employ the same design parameters and construction methods used for Units 1 and 2 (SCI 2001).

Construction of the proposed transmission line and 150-foot (46-meter) right-of-way would include the following roughly sequential major activities performed by small crews progressing along the proposed right-of-way:

- Surveying
- Staging area development
- Structure site clearing
- Stringing site grading/clearing
- Drilling holes for H-frame support poles/preparing and pouring concrete foundations for lattice structures
- Structure assembly/erection
- Conductor stringing/tensioning
- Right-of-way cleanup and restoration

In order to minimize erosion impacts along the proposed transmission line corridor during construction, standard erosion control measures would be implemented including the construction of silt fences and placement of hay bales to prevent the transport of silt and soil.

On the Spurlock Station site, Figure 4.2-1 shows a diagram of the wooden H-frame structure that would support the majority of proposed transmission line with the line strung from the substation and then south of the railroad tracks adjacent to the tailings pond until it would intersect the existing Kentucky Utilities 138-kV Transmission Line. The H-frame structures would then be sited either on the west or east side of the 138-kV Line to the Ohio River. The structure at the edge of the Ohio River would be a steel lattice structure with a corresponding steel lattice structure sited on the opposite side of the Ohio River in Brown County, Ohio. (See Appendix A, Photo 26 for an example of an existing steel lattice structure.) The 125-foot (38.1-meter) steel lattice structures are needed to give the proposed transmission line the necessary height above the Ohio River in order for the line not to interfere with river traffic.

The remainder of the proposed project, 2¼-miles (3.6-kilometers) of transmission line crossing the Ohio River into Brown County, Ohio, would be constructed on Ordovician Period formations consisting of interbedded limestone, shale and siltstone on ridgetops, hillsides and slopes that are easily eroded. The majority of the proposed transmission line structures would also be constructed of H-frame structures. The two support poles would be installed by drilling holes into the ground, approximately 2-feet (0.61 meters) in diameter and 5 feet (1.5 meters) deep. The two steel lattice structures directly on either side of the Ohio River would have 3,600 square foot (334 square meter) concrete foundations, measuring 60 feet x 60 feet (18 meters x 18 meters).

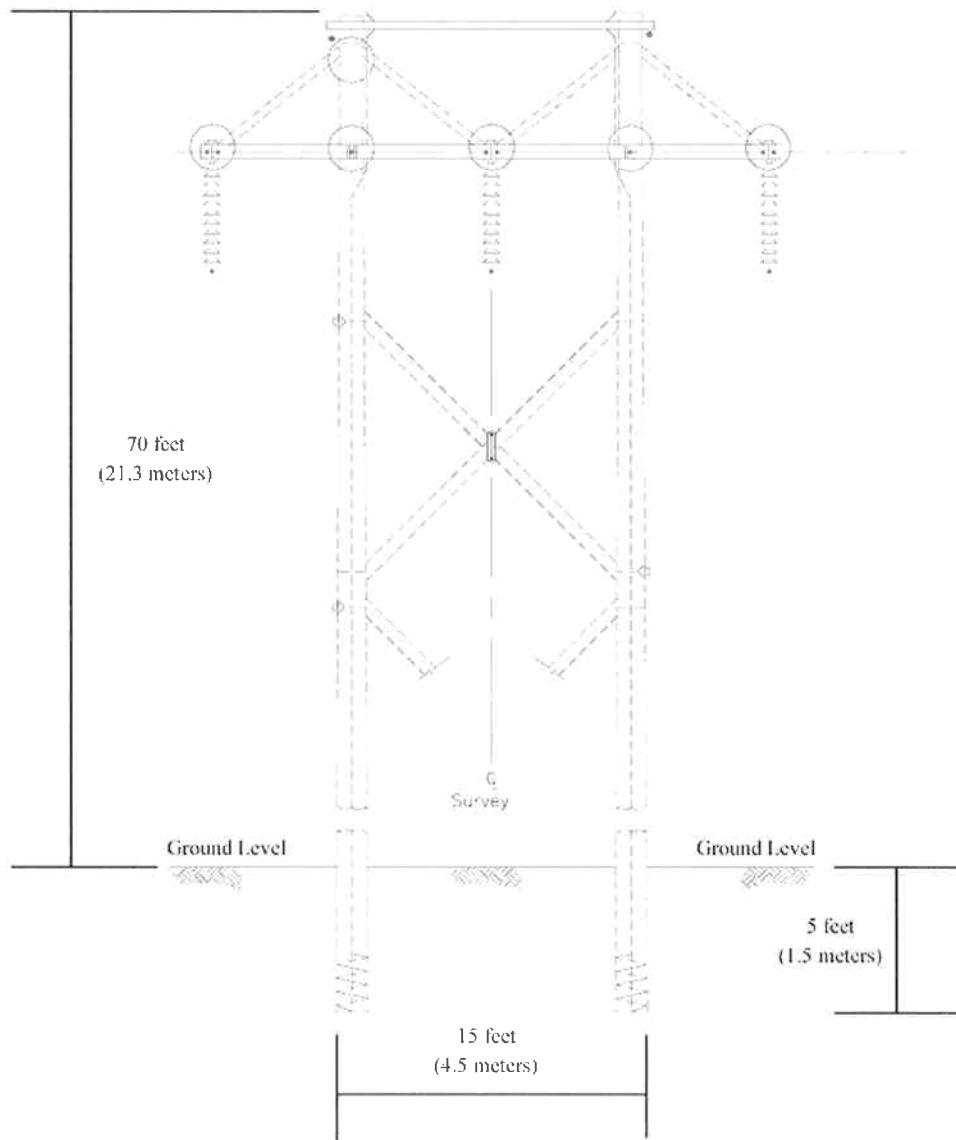


FIGURE 4.2-1.—H-Frame Structural Design

There are no industrial or ore mineral producing plants in Brown County, Ohio (USGS 1999). No industrial mineral resources are currently being excavated from, nor have ore mineral resources been found on Spurlock Station (KGS 1972, KGS 2001). There would be no impact to industrial or ore minerals from the proposed project.

The proposed project area on both the Kentucky and Ohio sides of the Ohio River is located within the "central stable region" for seismic activity on the North American continent (USGS 2001). The closest fault system is the Lexington fault system located approximately 35 miles (56.3 kilometers) from the proposed project site. The closest active seismic zone, the New Madrid Seismic Zone, is approximately 353 miles (568.1 kilometers) from the proposed project area. The National Earthquake Information Center has only documented minor earthquake activity within a 125-mile (201-kilometer) radius of Spurlock Station in the past 28 years. The strongest documented earthquake was located 28.7 miles (46.2 kilometers) from Spurlock Station, occurred in 1980, and registered 5.2 on the Richter Scale. The only effect at Spurlock Station from this moderate earthquake was noticeable ground shaking, as no damage was reported and there was no impact on plant operations.

All proposed facilities, on Spurlock Station would be designed and built per Kentucky Building Code, Section 16, Seismic Design Requirements (SCI 2001). The transmissions line would be constructed utilizing the Institute of Electrical and Electronics Engineers guidance on the Installation of Foundation for Transmission Line Structures. Therefore, the proposed project is not expected to effect or be affected by any faults systems or seismic events.

Soils

Units 3 and 4, their associated facilities, and 1¼ miles (2 kilometers) of transmission line would be constructed on the Wheeling-Nolin-Otwell Association of soils that underlie Spurlock Station. This soil series is generally well suited for construction as permeability is moderate and the shrink-swell potential is low (USDA 1983). A Prime Farmland Determination by the Natural Resource Conservation Service office in Maysville, Kentucky concluded that since it has already been developed for non-agricultural purposes, the land on Spurlock Station is exempt from a Prime Farmland Designation (LeGris 2001).

The Eden-Pate-Faywood Soil Association and soils of minor extent that underlie the proposed 2¼-mile (3.6-kilometer) transmission line corridor in Brown County, Ohio is formed of soil material and rock fragments that are unconsolidated, weathered, or partly weathered and that disintegrate in place and move down to the base of steep slopes by creep, slide or local wash (USDA 1987). The soils in this association are subject to hillside slippage and are considered unsuited to most kinds of building site development (USDA 1987). Because of the potential limitations of these soils, geotechnical studies of the right-of-way would be conducted to determine the exact placement of the single steel lattice structure and H-frame structures during the final design phase. The concrete pad foundation for the steel lattice structure and the drilled holes for the H-frame structures would be designed and placed to minimize potential hazards from ground failures such as slippage and landslides. To minimize potential impacts from erosion during the clearing of the right-of-way, standard erosion control measures would be

implemented during the construction of the transmission line structures. The right-of-way would also be revegetated with a grass mixture to prevent future erosion.

Prime Farmland Soils

A review of Prime Farmland soils found that two soils of minor extent, the silt loam Nolin and the silt loam Sciotovalle are located near the proposed transmission line corridor. The Prime Farmland Determination conducted by the Natural Resource Conservation office in Georgetown, Ohio concluded that 1.06 acres (0.43 hectares) out of a total of 136,396 acres (55,198 hectares) of farmland defined by the *Farmland Protection Policy Act* could be affected by the proposed transmission line corridor. This is 0.00077 percent of the total *Farmland Protection Policy Act* land in Brown County. Figure 4.2–2 highlights the two soil types and their proximity to the current transmission line corridor that the proposed line will parallel. The proposed line would run parallel on either the west or east side of the existing Kentucky Utilities 138-kV Transmission Line. The silt loam Sciotovalle unit, less than an eighth of a mile wide, would be spanned at the Ohio River edge as the steel lattice transmission line structure would be placed on the north side of State Route 52. Therefore, this prime farmland would not be affected. The silt loam Nolin unit would skirt the edge of the proposed transmission line corridor. The proposed transmission line would be placed in the center of the right-of-way so no structures would be located on or near the silt loam Nolin soil.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. There would be no soil disturbance from construction in the proposed right-of-way, including activity in the 100-year floodplain. There also would be no impact on or near Prime Farmland soils from construction of the transmission line structures and right-of-way in Brown County, Ohio. However, the soil disturbance associated with the ongoing construction of selective catalytic reduction units for Units 1 and 2 will continue regardless of whether Units 3 and 4 are built.

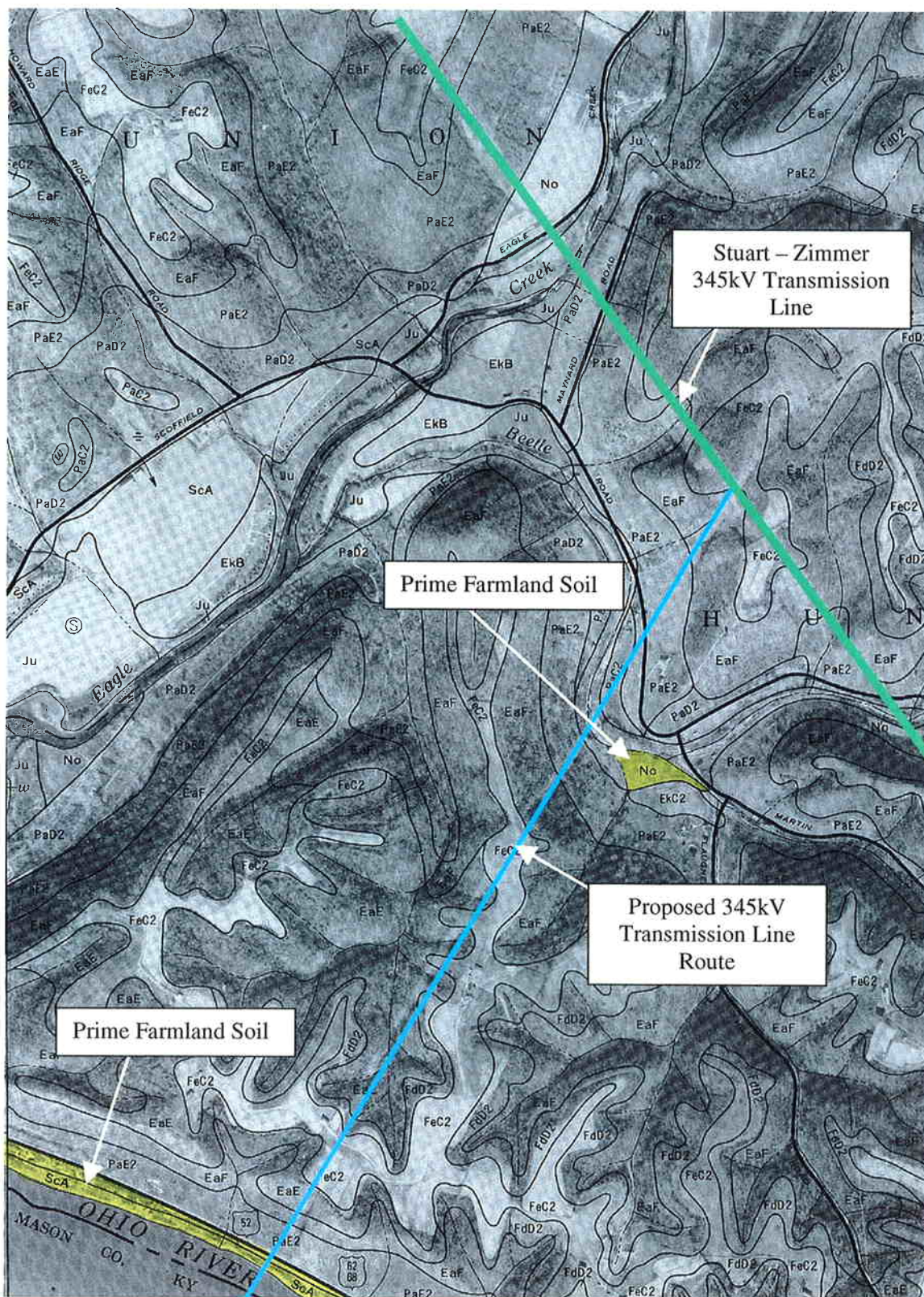


FIGURE 4.2-2. Prime Farmland Soils in Brown County, Ohio Near the Proposed Transmission Line Right-of-Way.

4.2.2 Operation

Proposed Action

Geology

There would be no operational impacts to geologic formations on Spurlock Station from Units 3 and 4 and their associated facilities. However, the topography of the ash landfill would continue to be changed by landfilling the ash, but at an accelerated rate with the addition of Units 3 and 4. The current life expectancy of the ash landfill is 80 years. The addition of the ash generated by Units 3 and 4 shortens the life expectancy of the ash landfill to 37 years. There would be no operational impacts to geological formations from the proposed transmission line.

Soils

Once Units 3 and 4, their associated facilities and 1¼ miles (2 kilometers) of the proposed transmission line would be constructed on Spurlock Station, and displaced soil is backfilled, there would be no impacts to the soil from the daily operations as vehicle traffic will utilize the paved and gravel roads already built on Spurlock Station.

There is the potential for accelerated erosion of the right-of-way from unauthorized all-terrain vehicle use on the right-of-way. EKPC would consult with landowners along the right-of-way on methods, such as gates, to limit access to the right-of-way.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. There would be no clearing of vegetation along the proposed right-of-way and potential soil erosion from this activity would not occur. There would be no potential for increased soil erosion caused by unauthorized vehicle use on the right-of-way.

4.3 ECOLOGICAL RESOURCES

This section presents the potential construction and operational effects of the proposed project on the ecological resources in the project area.

Methodology

The ecological impact analysis was performed by reviewing site documentation and previously published environmental analysis documentation, conducting a field survey in Brown County, Ohio, and coordinating with the U.S. Fish and Wildlife Service (USFWS) in Kentucky and Ohio.

4.3.1 Construction

Proposed Action

Because there are no ecological resources present in the main plant area at Spurlock Station, there would be no impact to such resources from construction of Units 3 and 4. Impacts to ecological resources from the Proposed Action would occur in association with construction of the transmission line portion of the project.

The primary impact to ecological resources would result from site preparation and construction of the proposed transmission line. These impacts would primarily be associated with the removal of existing woody vegetation from the areas required for the right-of-way, and would occur mostly in Brown County, Ohio. The proposed transmission line right-of-way in Brown County would cover approximately 41 acres (16.5 hectares). Impacts to ecological resources would not be expected outside of the area cleared for the right-of-way. The greatest amount of clearing of vegetation would be required in open brushy fields, with some clearing occurring in the maple/oak/hickory woodlands present on the south-facing ridge located just north of the Ohio River. Minimal clearing would be necessary in cropland or pastureland. Within cropland and pastureland, the right-of-way may be temporarily unavailable for cultivation or grazing during construction. Once construction is completed, the right-of-way can be used as the landowner desires. The only land lost to cultivation would be that occurring beneath the structures.

Because no wetlands occur along the proposed transmission line right-of-way, no impacts to wetlands are expected. Riparian zones associated with Eagle Creek in Brown County, Ohio, however, could be impacted by construction of the transmission line. Although final design of the transmission line structures is not complete, it is likely that the Eagle Creek riparian areas would be spanned such that support structures would not be placed within these sensitive communities.

The impacts of transmission lines on wildlife can be divided into short-term effects resulting from physical disturbance during construction and long-term effects resulting from habitat modification. The net effect on local wildlife of these two types of impacts is usually minor. A general discussion of the impacts of transmission line construction and operation on terrestrial wildlife is presented below.

Any required clearing and other construction-related activities would directly and/or indirectly affect most animals that reside and wander within the transmission line right-of-way. Some small, low-mobility species may be killed by the heavy machinery. These include several species of amphibians, reptiles, mammals, and, if construction occurs during the breeding season, the young of some species including nestling and fledgling birds. Animals that live underground such as mice and shrews may similarly be negatively impacted as a result of soil compaction caused by heavy machinery. Larger, more-mobile species such as birds, jackrabbits, and squirrels may avoid the initial clearing and construction activities and move into adjacent areas outside the right-of-way. Maintenance clearing activities during the breeding season may destroy some nests and broods. Wildlife in the immediate area may experience a slight loss of browse or forage material during construction; however, the prevalence of similar habitats in adjacent areas and regrowth of vegetation in the right-of-way following construction would minimize the effects of this loss. Little vegetation clearing is anticipated in cropland and pastureland; thus, impacts from clearing in these habitats should be minimal.

The increased noise and activity levels during construction could potentially disturb breeding or other activities of species inhabiting the areas adjacent to the right-of-way. These impacts are expected in most cases to be temporary. Although the normal behavior of many wildlife species would be disturbed during construction, no permanent impact to their populations would result.

The proposed transmission line would span the Ohio River and no construction activity would take place in the river or adjacent to it; structures would be placed outside the 100-year floodplain. No impacts to aquatic organisms in the Ohio River would be expected.

4.3.1.1 *Threatened and Endangered Species*

Section 7 of the *Endangered Species Act* requires all Federal agencies to ensure that actions they authorize, fund, or carry out do not jeopardize the continued existence of endangered or threatened species. Agencies must assess potential impacts and determine if proposed projects may affect listed species. As discussed in Section 3.3.5, potential Indiana bat habitat is present in approximately five percent of the proposed transmission line right-of-way corridor within Brown County, Ohio. Any trees that could be potential roosting habitat for the Indiana bat would either be cleared in the winter when the bats are hibernating in caves or a comprehensive bat survey would be conducted to insure that no Indiana bats are foraging or roosting in the proposed construction area. The U.S. Fish and Wildlife Service has recommended that if trees with exfoliating bark are encountered within the transmission corridor that they be saved. If these trees must be cleared, then they should not be cut between the dates of April 15 and September 15. If the cutting time period is not acceptable then mist net or other surveys should be conducted to determine if Indiana bats are present. The survey should be conducted in June or July and in coordination between the endangered species coordinator for the USFWS Ecological Services Office in Reynoldsburg, Ohio and East Kentucky Power Natural Resources staff (Lammers 2001). If survey results indicate the presence of the Indiana bat then cutting would be delayed until September 16. If these conditions are followed, then the proposed project would not adversely affect the Indiana bat.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. The potential disturbances to wildlife and conversion of the existing woodlands in Ohio to right-of-way would not occur. Ecological resources in the project area would be expected to remain as described in the affected environment, Section 3.3.

4.3.2 Operation

Proposed Action

Operation of Units 3 and 4 should not affect ecological resources in the project area, primarily because from an ecological standpoint there is no noticeable difference in the current plant configuration and the proposed addition of two generating units. Similarly, because transmission lines and structures currently exist in the area, ecological impacts from the addition of the proposed line and structures would be minor.

The danger of electrocution to birds from the new lines would be extremely low since the distance between conductors or conductor and structure or ground wire on 345-kV transmission lines is usually greater than the wingspan of any bird in the area (i.e., greater than approximately 6 feet). The existing transmission lines (both structures and wires) may currently present a collision hazard to flying birds, particularly migrants. However, the addition of the proposed line would cause minor or no increase to the existing collision hazard.

Given the height of the exhaust stacks for proposed Units 3 and 4, 720 feet (220 meters), the Federal Aviation Administration will require stack lighting. Published accounts of avian collisions with tall, lit structures date back in North America to at least 1880 (Manville 2000). The approximately 350 species of Neotropical migratory songbirds are particularly vulnerable to tower collisions during their nighttime spring/summer and fall/winter migrations. Collisions are especially pronounced when foggy, misty, low-cloud-ceiling conditions exist. The problem has been brought to the forefront with the proliferation of open structured communications towers and their associated guy wires that have been conservatively estimated to kill 4-5 million birds per year (Manville 2000). Differences do exist between solid towers and communications towers with the solid towers less of an avian threat. Solid tower lighting is the critical consideration for their operation. Under the Migratory Bird Treaty Act, the USFWS is responsible for the conservation and management of 836 species of migratory birds. To minimize bird strike mortality the USFWS recommends voluntary compliance with the *Service Interim Guidelines For Recommendations On Communications Tower Siting, Construction, Operation, and Decommissioning* and for tower construction and operation the use of low intensity white strobe lights programmed with the maximum off phase of 3 seconds (Manville 2001). The exhaust stacks lighting system would be designed in consideration of USFWS recommendations.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. However, because operation of the Proposed Action is expected to have no noticeable effects on ecological resources in the project area, there would be no noticeable differences between the Proposed Action and the No Action Alternative.

4.4 CULTURAL RESOURCES

This section describes the potential effects of the construction and operation of the Proposed Action on the cultural resources in the project area. As described in Section 3.4, cultural resources include prehistoric or historic archaeological sites, buildings, structures, objects, districts, or other places including natural features and biota that are considered to be important to a culture, subculture, or community. Cultural resources also include traditional lifeways and practices, and community values and institutions. Historic properties are those cultural resources that are listed on or eligible for listing on the National Register of Historic Places.

Methodology

Potential impacts to historic properties are assessed by applying the Criteria of Adverse Effect as defined in 36 CFR 800.5a. “An adverse effect is found when an action may alter the characteristics of a historic property that qualify it for inclusion in the National Register of Historic Places in a manner that would diminish the integrity of the property’s location, design, setting, workmanship, feeling, or association. Adverse effects may include reasonably foreseeable effects caused by the action that may occur later in time, be farther removed in distance, or be cumulative.” The Criteria of Adverse Effect provide a general framework for identifying and determining the context and intensity of potential impacts to other categories of cultural resources, as well, if these are present. Assessment of effects involving Native American or other traditional community, cultural or religious practices or resources requires focused consultation with the affected group.

As discussed in Section 3.4, an effort is in progress to identify the presence or absence of cultural resources that could be affected by the Proposed Action. This identification effort is incomplete, but no cultural resources have been identified in the portions of the project area where Gilbert Unit 3 will be located. The identification of cultural resources, National Register of Historic Places evaluation, effect determination and mitigation of any adverse effect must be addressed in consultation with SHPOs of Kentucky and Ohio, interested Tribes and other consulting parties prior to initiating construction of Unit 4 and the proposed transmission line. Compliance with these parallel requirements of the Section 106 process can be phased or deferred in consultation and agreement with the consulting parties.

4.4.1 Construction

Proposed Action

Under the Proposed Action, Units 3 and 4 would be constructed at the Spurlock Station site. The potential for archaeological and historic resources at the Spurlock Station site was investigated through a database file search, site survey and backhoe trenching at the Gilbert Unit 3 site. No buildings or structures of historic age are on the property and no evidence of surface or subsurface archaeological resources was found. Because of current and past site use, it is unlikely that there are any other types of cultural resources present on the site. The construction of Gilbert Unit 3 would not impact any cultural resources at the Spurlock Station site. However,

a similar subsurface investigation may be required at the footprint for Unit 4 before construction can begin.

Construction of the proposed 345-kV transmission line connecting the new units in Kentucky to the existing Stuart-Zimmer 345-kV line in Brown County, Ohio could directly impact cultural resources in the transmission line right-of-way, construction staging areas, and access roads. However, no cultural resource identification efforts, archaeological or historic structure surveys or consultations with the respective SHPO or Tribal groups have been initiated for the proposed transmission line Area of Potential Effect. These efforts will be completed prior to construction of the proposed transmission line. Any identified cultural resources need to be evaluated for National Register of Historic Places eligibility or other measure of significance and any adverse effect of the undertaking must be addressed in consultation with the respective SHPO and other parties. Avoidance of cultural resources is the preferred method of mitigation. If avoidance is not possible, it would be necessary to develop and implement data recovery plans or other mitigative measures to reduce or mitigate potential adverse effects.

Construction activities have the potential for resulting in the discovery of previously unknown archaeological resources. A discovery plan should be developed to address the procedures for stopping work in the vicinity of any discoveries during construction to allow for evaluation and mitigation of potential adverse effects to these resources.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. Because no cultural resources are known to exist on the Spurlock Station main plant site, no differences would be expected between the Proposed Action and the No Action Alternative. However, potential impacts to undiscovered cultural resources along the proposed right-of-way in Kentucky and Ohio would not occur under the No Action Alternative.

4.4.2 Operation

Proposed Action

The operation of Units 3 and 4 would not be likely to impact cultural resources. There are no known cultural resources onsite. The potential for impact to any offsite cultural resources would be limited to visual impacts to the setting of resources, if present. Since the Spurlock Station site is already developed as a power generating site, it is unlikely that there would be any changes affecting offsite cultural resources.

The placement of the new transmission line could alter the visual setting of cultural resources beyond the construction region of influence. However, placement of the proposed transmission line adjacent to the existing Kentucky Utilities transmission line would likely minimize such an impact. The presence or absence of such resources and whether the addition of the transmission lines would cause an adverse effect has not yet been determined.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. Potential alterations to the visual setting of cultural resources discussed above would not occur.

4.5 WATER RESOURCES

This section discusses the potential effects to the quality and quantity of surface water and groundwater from the construction and operation of the proposed project.

Methodology

The water resources and water quality analysis considers potential impacts to surface water and groundwater resources from construction and operation of the proposed project and the measures that can be taken to minimize or eliminate those impacts. Operational impacts from the proposed project have the most potential to affect the Ohio River and have been analyzed both qualitatively and quantitatively by comparing project impacts to existing water conditions of the Ohio River.

4.5.1 Construction

Proposed Action

The two surface waterbodies present in the project area in Mason County, Kentucky (the Ohio River, which borders Spurlock Station to the north, and Lawrence Creek, which runs through the Spurlock Station site approximately 1,200 feet [366 meters] to the west of the main plant area) should not be affected by the Proposed Action because construction activities would occur a good distance from them. Soils potentially eroded and transported from work areas would be expected to be deposited prior to reaching these surface waterbodies.

In Mason County, Kentucky on the Spurlock Station site, a portion of the proposed transmission line would be constructed just south of the railroad tracks at approximately 520 feet (158.0 meters) above msl. The U.S. Army Corps of Engineers calculated the 500-year floodplain to be 520.5 feet (158.0 meters) above msl on the Spurlock Station site. Given the infrequent occurrence of a 500-year flood (occurring once every 500 years) and location of the proposed transmission line structures on the edge of that floodplain, it is unlikely that impacts from a 500-year flood would occur, or if they did occur, that the impacts would substantially affect the proposed line.

The balance of the proposed transmission line on the Spurlock Station site would be constructed east of the tailings pond, oriented north-south, and run parallel, on either the west or east side, of the existing Kentucky Utilities 138-kV Transmission Line. The area east of the tailings pond to the Ohio River edge is located below the 100-year floodplain elevation of 514 feet (156 meters) above msl. In order to construct structures in the floodplain, EKPC would apply for the appropriate Federal and state permits as detailed in Chapter 6, Applicable Environmental Regulations and Permits.

In Brown County, Ohio, Beetle Creek and Eagle Creek could potentially be affected by soil erosion from the construction of the proposed transmission line corridor. To prevent transport of eroded material into surface waterbodies during construction, standard erosion control measures would be implemented including the construction of silt fences and placement of hay bales.

These measures should minimize potential adverse impacts to Beetle and Eagle Creeks from sedimentation.

Elevations along the proposed transmission line corridor in Brown County, Ohio range from 500 to 933 feet (152 to 167 meters) above msl. Due to constraints in terrain topography, the steel lattice transmission line structure that would be located adjacent to the Ohio River would be sited on the north side of State Route 52 at an elevation of approximately 525 feet (158.2 meters) above msl. Sited north of State Route 52, the steel lattice structure would be out of the Brown County 100-year floodplain without floodway of 514.8 feet (156.9 meters) and with floodway of 515.6 feet (157.1 meters) above msl.

The storage and use of fuel, lubricants, and other fluids during the construction of the facilities on Spurlock Station and the transmission line corridor could create a potential contamination hazard from spills and leaks. To prevent contamination of either surface water or groundwater sources during construction of the proposed project, several preventative measures would be taken. Oil and diesel fuel would be stored in clearly marked tanks onsite. The tanks would be provided with secondary containment structures. Construction equipment would be maintained regularly, and the source of leaks would be identified and repaired. Any soil contaminated by fuel or oil spills would be quickly removed and disposed at an approved disposal site. Lubricating oils, acids for equipment cleaning, and concrete curing compounds are potentially hazardous wastes that may be associated with construction activities. These would be placed in containers within secondary containment structures onsite, and disposed of at a licensed treatment and/or disposal facility in accordance with local or state regulations and in compliance with the manufacturer's recommendations. Paint containers would be tightly sealed to prevent leaks or spills. Excess paint would be disposed of consistent with the manufacturer's recommendations and according to applicable governmental regulations.

Spurlock Station personnel have already developed and implemented a Spill Prevention, Control and Countermeasure Plan in accordance with state and Federal law. Beside taking the above precautions during construction to prevent potential contamination hazards, the Spill Prevention, Control and Countermeasure program would also be utilized and would require construction measures (such as dikes or berms around certain storage tanks), inspections, and personnel training to prevent the occurrence of spills that could impact soil and water resources.

In order to additionally protect groundwater, the preparation and implementation of a groundwater protection plan, in compliance with 401 KAR 5:037, would likely be required. In this plan, technological means for protection of groundwater would be identified, taking into account the nature of the potential pollutants and the hydrological characteristics of the area. These could include, but are not limited to, operational procedures, personnel training, spill response capabilities, best management practices, runoff or infiltration control systems, and siting considerations.

During construction of the proposed project, small amounts of water would be required primarily for dust control. Potable water used by construction crews on Spurlock Station would be from the Maysville municipal supply, while other water required would be from the plant process water supply system. Water used for dust suppression on the transmission line corridor, if

required, would be supplied by trucks filled from the local municipal supply. The small quantities potentially required for construction would not be significant.

If construction of the Units 3 and 4 and the 1¼-mile (2-kilometers) proposed transmission line in Kentucky disturbs a total of 5 or more acres (2 hectares), EKPC would need to acquire a KPDES Permit for Storm Water Discharges. Since the total acreage disturbed during construction in Kentucky would be approximately 5.4 acres (2.2 hectares), EKPC would apply for this KPDES permit. In Ohio, because more than 5 acres (2 hectares) of land would be disturbed during construction of the proposed 2¼ mile (3.6-kilometer) transmission line, EKPC would need to apply for a general National Pollution Discharge Elimination System permit for Construction Storm Water with the Ohio Environmental Protection Agency.

An additional wastewater source associated with the proposed project would be sanitary wastes that are generated by plant washrooms, toilets and drinking fountains. Currently, 159 permanent employees discharge approximately 10,000 gallons per day (37,854 liters per day) of sanitary wastes to the Maysville Water Treatment Plant. Another 150 to 200 workers are currently on the Spurlock Station site constructing selective catalytic reduction units to reduce air emission for Units 1 and 2. These workers add approximately 3,750 to 5,000 gallons per day (14,195 to 18,927 liters per day) of wastewater to the sanitary sewer system. For this analysis, construction workers are expected to use a combination of portable toilets and onsite sanitary facilities, generating only half of the average daily sanitary waste for a worker, or 25 gallons per day (94.6 liters per day). During construction of the proposed project, there would be an additional 150 to 200 construction workers over the current workforce that would be expected to add 3,750 to 5,000 gallons per day (14,195 to 18,927 liters per day) of wastewater to the sanitary sewer system. This is not expected to exceed the current system capacity.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. Because there would be no construction, there would be no potential impacts to surface or groundwater from the storage and use of fuel, lubricants and other fluids used in construction of the Proposed Action. Such potential impacts from the ongoing construction of the selective catalytic reduction for Units 1 and 2, however, could still occur.

Under the No Action Alternative, there would be no need for Ohio National Pollution Discharge Elimination System and KPDES storm water discharge permits during construction. No water would be used for dust suppression on the transmission line corridor and no additional sanitary wastes would be added to the Maysville Water Treatment Plant.

4.5.2 Operation

Proposed Action

Current water use at Spurlock Station consists of an intake structure on the Ohio River that withdraws 3.5 MGD (13.2 MLD) and 14 groundwater wells that withdraw 10 MGD (38 MLD) for the operation of Units 1 and 2. With the construction of the proposed project, Units 3 and 4

would require the withdrawal of an additional 8.64 MGD (32.7 MLD) from the existing intake pipe on the Ohio River. No additional groundwater would be withdrawn for Units 3 and 4. Under Kentucky Revised Statute Chapter 151:140, no permit is required for water withdrawn from a public water source if the water is used in the production of steam at generating plants of companies whose retail rates are regulated by the Kentucky Public Service Commission. The Commission regulates the retail rates for EKPC.

The average daily flow of the Ohio River 1969 to 2000 at the Greenup Locks and Dam on the Ohio River U.S. Geological Survey mile mark 341 is 57.5 billion gallons per day (217.6 billion liters per day). As stated in Section 3.5.1, the Greenup and Meldahl Locks and Dam have been collectively controlling the flow of the Ohio River between U.S. Geological Survey mile mark 341 and U.S. Geological Survey mile mark 436, respectively, since 1964. Spurlock Station is located between the two locks and dams on U.S. Geological Survey mile mark 414. The withdrawal for the proposed project of 8.64 MGD (32.7 MLD) represents 0.01 percent of the average daily flow and should not noticeably impact water availability during average flow conditions. The minimum 7-day 10-year low flow at Spurlock Station is 6.3 billion gallons per day (23.9 billion liters per day). The daily withdrawal from the project would represent approximately 0.1 percent of this low flow average, and would not be expected to impact water availability during low flow conditions.

As discussed in Section 3.5.1, the Ohio River currently receives treated wastewater from several permitted sources in the vicinity of Spurlock Station and water quality is designated as Warm Water Aquatic Habitat and Primary/Secondary Contact Recreation. The current amount of wastewater being discharged to the Ohio River from Spurlock Station is 2.5 MGD (9.4 MLD). The proposed project would add 2.2 MGD (8.3 MLD) of wastewater.

Under its KPDES permit, Spurlock Station personnel currently monitor for the following contaminants: metals, cyanide, and total phenols (antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium and zinc) (KY NREPC 2000). The treated wastewater generated by the proposed project is expected to contain the same contaminants and only a minor modification to the KPDES permit would be required. This modification would concern the recalculation of wastewater flow to the ash pond to reflect the increased discharge. The additional wastewater generated by the proposed project would flow into and through current monitoring lagoons and outfalls. No new outfalls would be added to Spurlock Station.

The Spill Prevention, Control and Countermeasure Plan currently in place for Spurlock Station would be implemented for the proposed project. New personnel hired to operate Units 3 and 4 would be trained in how to apply the measures in the plan to prevent potential contamination hazards from spills and leaks that could impact soil and water resources.

The proposed project would require 50 additional permanent workers to be hired for the operation of Units 3 and 4 who would generate 3,144 gallons (11,899 liters) of additional sanitary wastes to be processed by the Maysville Water Treatment Plant.

The proposed transmission line is not expected to have any effects on surface or groundwater resources during operation.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. Therefore, there would be no additional withdrawal of water from or discharge to the Ohio River. No additional permanent workers would be hired to operate Units 3 and 4 and the associated addition to the sanitary waste stream would not occur.

4.6 LAND USE

This section discusses the potential construction and operational effects of the proposed project on land use and recreational resources within the vicinity of the project. Impacts to land use are determined relative to the context of the affected environment described in Section 3.6.

Methodology

To determine the impacts of the proposed project, both the land area displaced by the construction of the proposed project and the compatibility of the proposed project with current land use is considered. The context for the proposed project in Mason County, Kentucky is the industrial sites of Spurlock Station, a power generating facility, its neighbor to the east, Inland Paperboard and Packaging, a paper products recycling and manufacturing facility, and the open cultivated land between the two sites. The proposed project extends across the Ohio River and into Brown County, Ohio where primary land use is forested land with agricultural land interspersed. There are also scattered residences located along the Ohio River and along Flaughter Hill and Scoffield Roads in the vicinity of the proposed transmission line corridor in Brown County. Consideration is given to any unique characteristics of the area (for example, recreational opportunities), and the degree to which the proposed project may adversely affect such unique resources. The land use evaluation includes both temporary land use impacts during construction and permanent changes to land use resources.

4.6.1 Construction

Proposed Action

On Spurlock Station, Units 3 and 4 of the proposed project would be constructed adjacent to Unit 2. The footprint of Units 3 and 4 is 2.9 acres (1.2 hectares) and the approximate total footprint of the proposed units and additional facilities, such as bag houses, limestone related buildings and cooling towers, is 5.4 acres (2.2 hectares). The 2,500-acre (1,011-hectare) Spurlock Station is an industrial site so construction of the proposed project on the site would not affect current land use.

The ash landfill, located in the western corner of Spurlock Station and consisting of three separate cells, A, B, and C, is classified as a special waste landfill. EKPC has applied for a permit to expand Cell A horizontally and Cells B and C horizontally and vertically. The additional horizontal expansion would add 53 acres (21 hectares) to the landfill area, thus changing that land from undeveloped rural to special waste landfill. The current life expectancy of the ash landfill is 80 years. The addition of the ash generated by Units 3 and 4 of the proposed project shortens the life expectancy of the ash landfill to 37 years.

One and a quarter miles (2 kilometers) of the 3.5-mile (5.6-kilometer) proposed 345-kV transmission line would be located in Mason County, Kentucky and extend from the existing substation on Spurlock Station, running southeast parallel with the Chesapeake and Ohio Railroad tracks, and then turn northeast toward the Ohio River south of the ash pond, running parallel on either the west or east side the existing Kentucky Utilities 138-kV Transmission Line

right-of-way (see Figure 2.1–2). This portion of the proposed transmission line would be located in an open area north of Inland Paperboard and Packaging between existing railroad tracks. The land displaced by the 1¼-mile, 150-foot right-of-way would be approximately 22.7 acres (9 hectares).

The majority of the proposed transmission line structures would be of H-frame construction with each wooden pole of the H-frame measuring 1 foot (0.3 meters) in diameter. The height of the H-frame structure would be 70 feet (21.3 meters) above ground and the width between the poles would be 15 feet (4.5 meters) (See Figure 4.2–1). There would also be two 125-foot (38.1 meters) steel lattice transmission line structures placed directly on either side of the Ohio River. The concrete foundations for these structures would cover 3,600 square feet (334 square meters), measuring 60 feet x 60 feet (18 meters x 18 meters). The taller lattice structures would be used directly on either side of the Ohio River in order to give the transmission line the necessary height above the river so the line does not interfere with river traffic. There would be approximately eight H-frame structures and one steel lattice structure along the proposed transmission line corridor in Kentucky. The total footprint for the transmission line structures would be approximately 5,400 square feet (500 square meters) or 0.12 acres (0.05 hectares). The land crossed by the proposed transmission line is located on and adjacent to the industrial land of Spurlock Station and Inland Paperboard and Packaging, and therefore current land use would not be affected by the construction of the proposed line.

The final 2¼ miles (3.6 kilometers) of the proposed 345-kV transmission line would continue its parallel path along the Kentucky Utilities 138-kV transmission line right-of-way, cross the Ohio River into Brown County, Ohio, and finally connect to the Stuart-Zimmer 345-kV transmission line. While no specific land use plans were available for the proposed project area in Brown County, Ohio, the proposed transmission line and 150-foot (46-meter) right-of-way would run through forested land with agricultural land and residences interspersed. Forty-one acres (16.5 hectares) of this land would be cleared for the right-of-way, changing its current land use from residential, forested and agricultural to a utility corridor or right-of-way. With approximately 15 H-frame and one steel lattice structures sited in the 2¼-mile (3.6-kilometer) proposed right-of-way in Ohio, the total footprint of the structures would be approximately 6,991 square feet (650 square meters) or 0.16 acres (0.06 hectares).

As stated in Section 3.6.2, Recreation, the closest recreational facility is the public access site on Lake Charles located 1 mile (0.6 kilometers) from Spurlock Station in Mason County, Kentucky. No recreational facilities would be affected by the proposed project.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. The conversion of existing land uses in Ohio to right-of-way would not occur. Current land uses in the area would be expected to continue.

4.6.2 Operation

Proposed Action

Any land use changes from the proposed project would only occur during the construction phase. No land use impacts are expected during operation of the proposed project.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. Current land use in the area would be expected to continue.

4.7 VISUAL RESOURCES

This section discusses the potential effects of the proposed project on visual resources in the vicinity of the Spurlock Station and along the proposed transmission line in Brown County, Ohio. The methodology for determining impacts is presented, along with a description of the impacts during construction and operation.

Methodology

The visual quality of the existing landscape in the vicinity of the proposed project is discussed in Section 3.7. The existing visual quality is based on evaluation of the natural landscape and existing modifications for form, line, pattern, color, contrast, and texture. The sensitivity of the existing visual resources to change associated with the proposed project depends on whether an area already contains modifications (in this case, buildings or transmission lines), and the degree of public and agency concern for changes to the visual landscape.

In assessing the potential effects of the proposed project, the visual features that would be associated with the project during construction and operation are evaluated. The discussion includes the physical or visual relationships that influence the visibility of the proposed landscape changes, such as whether the project would be in the background or foreground for potential viewers.

The significance of impacts to visual resources is dependent upon the existing character of the resource and the amount of change to that resource. Even minor changes to resources of high public value such as rare or special landscapes would be significant. The most significant visual impacts would occur in existing high quality landscapes that have a high sensitivity to change (for example, areas of particular public concern or specially protected areas).

4.7.1 Construction

Proposed Action

Visual impacts from construction activities along the proposed transmission line right-of-way would result from the clearing of trees and from the construction equipment required for the transmission line support structures and conductor stringing. The proposed route for the 3.5-mile (5.7-kilometer) 345-kV transmission line extends northeasterly from the project site across the Ohio River and into Brown County, Ohio, where it interconnects with the existing power grid. An existing Kentucky Utilities 138-kV Transmission Line crosses the Ohio River and parallels the proposed route, along a 200-foot (61-meter) wide cleared right-of-way through a mixture of agricultural and forested land. Multiple residences are contained within the viewshed of the existing transmission line, primarily along the north bank of the Ohio River directly across from the Spurlock Station.

A short-term visual impact would be generated during construction from dust and equipment. If necessary, dust control measures would be implemented by EKPC to minimize impacts. Access used for construction that would not be used for ongoing operation and maintenance would be

restored to near preconstruction conditions to re-establish the natural soil and vegetation conditions.

The visual impact of the clearing of trees in Brown County, Ohio for the 150-foot (46-meter) right-of-way would be minimized by the fact that it would parallel an existing transmission line. The H-frame wood pole structures, would be 70 feet (21.3 meters) tall and 15 feet (4.5 meters) wide. (See Figure 4.2–1). The two 125-foot (38.1-meter) tall lattice structures would be sited directly on either side of the Ohio River near the existing lattice structures for the Kentucky Utilities 138kV Transmission Line that the proposed transmission line would parallel. (See Appendix A, Photo 26 for the existing lattice structure.) The existing previous disturbance to the natural landscape reduces the visual sensitivity of the landscape to change. The transmission line structures would be visible from brief sections of both Highway 8 in Kentucky and Highway 52 in Ohio, running along the south and north sides of the Ohio River.

The visual impact of construction activities at the Spurlock Station would be primarily from the introduction of Units 3 and 4 boiler units, two 720-foot (220-meter) cement stacks, and a cooling tower system. The boiler units would be cream color and approximately 17-stories high, similar to the existing boiler units. The cement stacks would be similar to the two existing cement stacks, though approximately 85 feet (26 meters) shorter. These features would be visible from portions of Highway 8 and 22, including several residences in the area. Views of the proposed project are partially obscured by the hilly terrain and trees in the area. Given that the Spurlock Station is located on an approximately 2,500-acre (1,011-hectare) piece of property, daily construction activities near the ground level would not be highly visible from public roads or residences.

The Ohio River Scenic Route, which includes the section of Highway 52 in the proposed project area, has been designated as a National Scenic Byway, with almost continuous views of the Ohio River stretching 462 miles (758 kilometer) from Cincinnati to Pennsylvania. Both the Spurlock Station additions and a portion of the proposed transmission line would be visible from the Ohio River and the Ohio River Scenic Byway. Thus, agency and public concerns may be raised for any visual changes that would affect the Ohio River Scenic Byway. Given the recreational use of the Ohio River, public concern may also be raised for changes visible from the river. However, agency and public concern for visual changes may be minimized by the fact that alteration to the natural landscape in the immediate vicinity of the proposed project already exists, and that the proposed project facilities look similar to the existing facilities.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. The potential changes to the viewshed from the Proposed Action would not occur. However, visual changes associated with ongoing construction of the selective catalytic reduction for Units 1 and 2 would continue under the No Action Alternative.

4.7.2 Operation

Proposed Action

The visual impacts of ongoing operation of the proposed project would include all of the visual changes introduced during construction, as described above. In addition, steam clouds rising into the air from the new cooling towers would be visible. The visibility of the steam clouds varies with meteorological conditions and the vantage point of the viewer.

Another visual change associated with the proposed project would be the increased frequency of coal and limestone deliveries. Coal deliveries would occur primarily by barge, with a frequency of 9 to 10 barges per week per unit for Units 3 and 4. Currently, 3 to 4 barges arrive per week to supply Units 1 and 2. The limestone delivery would occur by truck along Highway 8. Limestone delivery trucks would be limited to a 6-hour period during the daytime, 5 days per week. During these delivery times, approximately 14 trucks of limestone would be delivered to the Spurlock Station each hour. The visual impact of the increased barge and truck traffic would be minimized by the moderate volume of existing traffic in the area.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. Visual changes associated with increases in steam emissions and increased truck and barge traffic would not occur. However, visual changes from the selective catalytic reduction currently being constructed for Units 1 and 2 would occur under the No Action Alternative.

4.8 SOCIOECONOMICS

Any sudden influx of capital or employment, such as a large construction project, to a region will impact the existing socioeconomic environment to some degree. Socioeconomic factors, such as employment, income, population, housing, and community services, are interrelated in their response to the implementation of an action. This section describes the potential effects of the EKPC Units 3 and 4 Project on the existing socioeconomic environment of the nine-county region of influence.

Methodology

Socioeconomic impacts are addressed in terms of both direct and indirect impacts. Direct impacts are those changes that can be directly attributed to the Proposed Action, such as changes in employment and expenditures from the construction and operation of the proposed plant. Indirect impacts to the region of influence occur based on the direct impacts from the Proposed Action. Two factors, (1) the changes in site purchase and non-payroll expenditures from the construction and operation phases of the plant, and (2) the changes in payroll spending by new employees, indirectly lead to changes in employment levels and income in other sectors throughout the region of influence. The total economic impact is the sum of the direct and indirect impacts.

The direct impacts estimated in the socioeconomic analysis are based on project summary data developed by Rural Utilities Service in conjunction with EKPC's contractors and representatives. Total employment and earnings impacts were estimated using Regional Input-Output Modeling System multipliers developed specifically for the EKPC Units 3 and 4 Project region of influence by the U.S. Bureau of Economic Analysis. These multipliers are developed from national input-output tables maintained by the U.S. Bureau of Economic Analysis and adjusted to reflect regional trading patterns and industrial structure. The tables show the distribution of the inputs purchased and the outputs sold for each industry for every county in the United States. The multipliers for this analysis were developed from the input-output tables for the nine counties comprising the region of influence. The multipliers are applied to data on initial changes in employment levels and earnings associated with the proposed project to estimate the total (direct and indirect) impact of the project on regional earnings and employment levels. For this analysis, the term direct jobs refers to the employment created by the project and direct income refers to project workers' salaries. The term indirect jobs refers to the jobs created in other employment sectors as an indirect result of new employment at the construction site and indirect income refers to the income generated by the new indirect jobs.

The importance of the actions and their impacts is determined relative to the context of the affected environment, or project baseline, established in Section 3.8. The baseline conditions provide the framework for analyzing the importance of potential economic impacts that could result from the project. Impacts would be determined to be significant if the change resulting from the action analyzed would exceed historical fluctuations in the regional economy.

EKPC and its contractors provided estimates of construction and operations workforces and durations. The overall construction workforce would average 300 workers and reach a peak

force of 400 for short periods of time. Each unit would take approximately 29 months to build. The total construction time for the project, including the transmission line, is 58 months. The socioeconomic impacts on employment and income are evaluated during the two phases of the project, construction and operation. The construction phase is analyzed for two different levels, average worker level and peak worker level. The operation of the two new units is expected to require 50 workers in addition to the 159 workers currently employed onsite.

4.8.1 Construction

Proposed Action

Currently, Selective Catalytic Reduction units are being added to the existing units at the plant. These additions employ an average of 150 construction workers. EKPC intends to utilize these 150 construction workers for the installation of Units 3 and 4. Thus, the project would directly create an additional 150 to 250 construction jobs in Mason County, Kentucky. All construction labor would be unionized construction workers from Cincinnati, which is located in Hamilton County, Ohio. The average salary for a laborer employed in the heavy construction field in Hamilton County was \$56,407 in 1999 (CBP 1999i). The total amount of direct income generated by this project per year of construction would be between \$8.46 million and \$14.10 million, depending on the duration of peak employment levels. For each month of peak onsite employment, \$470,000 would be added to the average annual level of \$8.46 million. The total amount of direct income generated during the construction of the project would be \$40.89 million at average staffing levels.

The construction of the project would also create additional indirect jobs throughout the region of influence. Many of these jobs would be created in the Cincinnati Metropolitan Area as the construction workers would be traveling from this area and they would spend most of their money closer to their homes. The indirect jobs will also generate additional quantities of indirect income.

The total income generated by this project would economically benefit individuals in the region of influence and the additional tax revenue generated by the project and new salaries would benefit the counties comprising the region of influence as well as the states of Kentucky and Ohio.

In general, the construction of this project would not significantly impact community services because people currently residing within the region of influence would fill the jobs generated by it. Slight impacts may occur to housing in Mason County, Kentucky or Brown County, Ohio because construction workers may opt to reside locally during the workweek and commute to Cincinnati on weekends. Existing housing should be sufficient to handle any demand generated by construction workers; however, housing may become scarce during periods of peak construction should the majority of the workers choose this option. Police, fire and medical services would be responsible for any accidents at the project site and additional demand for their services may be required. This demand may be offset by the creation of new employment opportunities in these fields from the tax revenues generated by this project. Other areas of

community services, such as education, may also benefit from tax revenues generated from the project.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. Since no construction would occur, no additional jobs would be generated by this action. The 150 construction workers currently employed onsite would not be employed in the construction of the two new units and would have to seek employment elsewhere. They would not be significantly impacted since they are unionized labor and would be able to readily find other construction projects to work on. No tax revenue or income would be generated under this action and no impacts would occur to community services.

4.8.2 Operation

Proposed Action

Operation of the two new units would directly create 50 jobs in Mason County, Kentucky. The average salary for a utility employee in Mason County was \$48,721 in 1999 (CBP 1999e). The total amount of direct income generated by the operation of the two new units at the Spurlock site would be \$2.44 million per year. These jobs would also generate additional indirect jobs and income. These indirect jobs would most likely be located in and around Mason County, Kentucky and Brown County, Ohio, as the majority of the employees who operate the plant live in this area.

The total income generated by this project would economically benefit individuals in the region of influence and the additional tax revenue generated by the project and new salaries would benefit the counties comprising the region of influence as well as the states of Kentucky and Ohio.

In general, the operation of this project would not significantly impact community services because people currently residing within the region of influence would fill the jobs generated by it. Police, fire and medical services would be responsible for any accidents that occur during facility operation and additional demand for their services may be required. This may be offset by the creation of new employment opportunities in these fields from the tax revenues generated by this project. Other areas of community services, such as education, may also benefit from tax revenues generated from the project.

No Action Alternative

No additional units would operate at the Spurlock site and no new jobs would be created. No tax revenue or income would be generated under this action and no impacts would occur to community services.

4.9 ENVIRONMENTAL JUSTICE

Pursuant to Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (59 *Federal Register* 32), this section identifies and addresses any disproportionately high and adverse human health or environmental effects on minority or low-income populations from activities described in other sections of this environmental assessment.

Methodology

Environmental justice guidance developed by the Council on Environmental Quality defines “minority” as individual(s) who are members of the following population groups: American Indian or Alaskan Native, Asian or Pacific Islander, Black, or Hispanic (CEQ 1997). Minority populations are identified when either the minority population of the affected area exceeds 50 percent or the percentage of minority population in the affected area is meaningfully greater than the minority population percentage in the general population in the surrounding area or other appropriate unit of geographical analysis. Low-income populations are identified using statistical poverty thresholds from the Bureau of Census (defined in 2000 as 1999 income less than \$17,463 for a family of four).

Environmental justice impacts become issues of concern if the proposed activities result in disproportionately high and adverse human and environmental effects to minority or low-income populations. All resource areas analyzed in this environmental assessment have been included in the environmental justice analysis. While the magnitude of impacts from the majority of the resource areas can be measured by proximity to the project, special attention must be given to the effects on human health in local communities. Disproportionately high and adverse human health effects are identified by assessing these three factors to the extent practicable:

- Whether the health effects, which may be measured in risks or rates, are significant (as defined by *National Environmental Policy Act*) or above generally accepted norms. Adverse health effects may include bodily impairment, infirmity, illness, or death.
- Whether the risk or rate of exposure to a minority population or low-income population to an environmental hazard is significant (as defined by *National Environmental Policy Act*) and appreciably exceeds or is likely to appreciably exceed the risk or rate to the general population or other appropriate comparison group.
- Whether health effects occur in a minority population or low-income population affected by cumulative or multiple adverse exposures from environmental hazards.

Environmental impacts from all resource areas are considered during this analysis.

The Council on Environmental Quality recognizes that the identification of disproportionately high and adverse human health or environmental impact on a low-income, minority, or Indian tribe population does not preclude a proposed agency action from going forward, nor should it lead to a conclusion that a proposed action is environmentally unsatisfactory. The identification

of environmental justice issues should heighten agency attention to alternatives, mitigation strategies, monitoring needs, and preferences expressed by the affected community or population (CEQ 1997). As discussed in Chapter 2 of this environmental assessment, the siting analysis concluded that using the existing infrastructure at the Spurlock Station was economically favorable and also presented the least potential to impact the environment. Therefore, alternative siting options are not considered under this environmental justice analysis.

Affected Environment Summary

The percentage of minority populations in Mason County, Kentucky and Brown County, Ohio are lower than their relative state levels. The town of Maysville, which is approximately 5 miles (8 kilometers) southeast of the project site, does have a higher percentage of African-American residents than the rest of Mason County. Approximately 1,038 of the 1,203 African-American residents of Mason County live in Maysville (Census 2000b). Maysville also has a higher percentage (20.7 percent) of low-income residents than Mason County (18.2 percent), which has a slightly higher level than the State of Kentucky (16.0 percent). Approximately 1,862 of the 3,058 low-income residents of Mason County live in Maysville. The town of Ripley, located approximately 3 miles (4.8 kilometers) north of the project site on the Ohio shore of the river, has a higher percentage of African-American and Hispanic residents and residents of two or more races than Brown County. Approximately 116 of the 389 African-American residents of Brown County live in Ripley. Twelve of the County's 185 Hispanic residents and 22 of the County's 255 residents of two or more races live in Ripley. Ripley also has a significantly higher level of low-income residents than the County, with approximately 421 of the County's 5,074 low-income residents living in the town.

4.9.1 Construction

Proposed Action

No significant environmental impacts would occur outside of the project site during construction. No disproportionate impacts would occur to minority or low-income populations. Therefore, there are no environmental justice impacts from the construction of the Proposed Action.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. Since no environmental justice impacts would occur under the Proposed Action, there would be no difference between the Proposed Action and the No Action Alternative concerning Environmental Justice.

4.9.2 Operation

Proposed Action

The operation of Units 3 and 4 would result in increases in air emissions of sulfur dioxide, nitrogen oxides, hazardous air pollutants, and inhalable particulate matter from the Spurlock

Station. These air emissions, although not considered an adverse environmental impact as discussed in Section 4.1, Air Quality and Noise, would disproportionately affect African-American and low-income residents of Mason and Brown Counties. This is because large percentages of the respective counties' populations of these individuals live near the project site (i.e., in Maysville, Kentucky and Ripley, Ohio). The overall levels of each pollutant would still be well below PSD increment limits and ambient air quality standards, as discussed in Section 4.1. No human health impacts or other environmental impacts would disproportionately affect minority or low-income populations, and therefore no environmental justice impacts would occur.

No Action

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. Although no health impacts would be expected, the potential to disproportionately affect African-American and low-income residents of Mason and Brown Counties from an increase in air emissions at the Spurlock Station would not occur.

4.10 INFRASTRUCTURE

This section summarizes the additional equipment that would be required for the proposed project and the equipment the project would utilize from the existing infrastructure during construction and operation. The No Action Alternative is also discussed.

Methodology

The infrastructure analysis examines the existing utilities and other resources, as described in Section 3.10, Infrastructure, that are available to support the construction and operation of the proposed project. Site infrastructure impacts will be assessed by overlaying the support requirements of the proposed project on current site infrastructure capabilities. Current site infrastructure capabilities include water supply, wastewater treatment and discharge, barge and rail facilities, coal storage, process and handling equipment, chemical maintenance system, ignition fuel oil supply, trucks and roads, and other ancillary equipment. Existing infrastructure that would be utilized for the proposed project will be highlighted when defining additional infrastructure requirements for the construction and operation of the proposed project.

4.10.1 Construction

Proposed Action

The proposed project would install two 268-MW coal-fired electric generating units, Units 3 and 4, on Spurlock Station and a double-circuit 345-kV, 3.5-mile (5.6-kilometer) transmission line with a 150-foot (46-meter) right-of-way from Spurlock Station that would connect to the Stuart-Zimmer 345-kV transmission line in Brown County, Ohio. Units 3 and 4 would require power generating, water circulating, air emissions, coal handling, and electricity generating and transfer equipment similar to Units 1 and 2. Additionally, limestone preparation, handling and disposal equipment would be required as the circulating fluidized bed combustion boilers of Units 3 and 4 are expected to burn high sulfur coal. When high sulfur coal is combined with limestone in the combustion process, the sulfur adsorbs to the limestone (attaches to its surface), thus significantly reducing SO₂ emissions. The equipment for Units 3 and 4 would be housed in buildings constructed adjacent to Unit 2. Table 4.10–1 summarizes the equipment that would be installed for each unit by general category.

TABLE 4.10-1.—Equipment to be Installed for Each Unit

Equipment Type	Equipment Description
Power Generating Equipment	
Steam Generating Unit (CFBC Boiler)	Steam flow from superheater outlet lb/hr: 1,922,000; pressure: psig 2,535, temp: 1,005 °F (544 °C) Steam flow from reheater outlet lb/hr: 1,695,781; pressure: psig: 584.6; temp: 1,005 °F (544 °C)
Startup Fuel	Oil: Grade No. 2; ; heating value, Btu/lb: 19,350
Startup Equipment	4 Grade No. 2 fuel oil burners; eight fuel feeders; ignition oil pumps
Operating Fuel	Coal: Western KY, Pine Branch and Pittsburgh 8 Size of Coal: 0.25 inches (0.6 centimeters)
Boiler Control System	Provides continuous process control of following boiler systems: <ul style="list-style-type: none"> • Primary/secondary air control • Fuel control • Emission control • Oxygen correction • Drum level (feedwater) control • Steam temperature control • Furnace draft control • Furnace temperature control • Furnace chamber differential pressure control • Boiler master control • Controls to read, measure and adjust system as necessary
Boiler Feed and Boiler Feed Booster Pumps	
Sootblowers and Soot Cleaning Equipment	
Air Compressor	One type multi-stage centrifugal with water-cooled intercoolers and an air receiver sized to support sootblowing and fuel oil atomization
Instrument Air System	Existing headers will be extended to serve Units 3 and 4; air dryers: current capacity to be examined for additional need; if necessary, additional air dryers would be added
Turbine-Generator Unit	Tandem compound, double flow, single reheat unit <ul style="list-style-type: none"> • Throttle steam pressure: psig: 2,400 • Throttle steam temperature: 1,000 °F (542 °C) • Nominal rating: kW: 300,000; guaranteed capability: kW: 298,456
Water Circulating Equipment	
Condensing Equipment	Condenser; two Feedwater Heaters; two condensate pumps; two vacuum pumps; tubes; water boxes; tube cleaning system (continuous recirculated ball system with automatic ball collecting screen cleaning sequencing control system)
Circulating Water System	Recirculating system with cooling tower; circulating pumps at tower basin with underground pressure lines to condenser and return to cooling tower
Cooling Tower	Multi-cell, induced draft, counter-flow
Piping	Aboveground: steel pipe; underground: reinforced concrete cylinder pipe
Tubular Feedwater Heaters	
Deaerating Feedwater Heater	
Air Emissions Equipment	
Flue Gas Conditioning Equipment	Designed to limits emissions at the stack to: <ul style="list-style-type: none"> • Particulate: 0.03 lbs/Mbtu heat input • Sulfur dioxide (SO₂): 0.2 lbs/Mbtu heat input • Nitrogen oxides (NO_x): 0.1 lbs/Mbtu heat input

TABLE 4.10-1.—Equipment to be Installed for Each Unit (continued)

Equipment Type	Equipment Description
Baghouse	Flue gas: 3,660,000 lbs/hr at 315 °F (158 °C); removal efficiency: 99.5%; bag cleaning method: pulse air
Selective Non-Catalytic Reduction System (SNCR)	Reagent : anhydrous ammonia; storage: existing tanks; injection blower
Fans	Two primary fans, two secondary fans; two induced draft fans; three boiler fluidizing air blowers; three fluidized bed ash cooler blowers
Chimney	720 feet (216 meters) above ground floor elevation in plant; outlet size: 15 feet (4.5 meters) diameter
<i>Coal Handling Equipment</i>	
Conveyor Belts	Existing conveyors from coal pile utilized to move coal into buildings Existing Unit 2 conveyors to deliver coal to new unit conveyors for Gilbert Unit 3 New conveyors to move coal to Unit 4
Discharge chutes	New discharge chutes with motor operated flop gates to direct coal to Units 2, 3 and 4 to replace existing discharge chutes
Coal Silos	Existing silos utilized
Dust Collection System	Bin vent filter mounted to each coal silo with one fan to exhaust from two vent filters; dust collector and fan to exhaust from conveyor transfer points
<i>Limestone Equipment</i>	
Limestone preparation system	Limestone milling system consisting of mill(s), feeders, heaters/dryers, fans, ducts and other required equipment
Storage silos	Two limestone day storage silos
Limestone Handling	
Two-hopper receiving/reclaim structure	<ul style="list-style-type: none"> • Vibrating feeders to receive limestone from hoppers and discharge through vibrating feeder to conveyor • Reclaim: trucks will dump directly on ground storage pile; end loader will move limestone from ground to reclaim hoppers
Transfer house	Transfer chute to receive limestone from hopper conveyor belt and discharge to plant conveyor belt
Plant conveyor belt	Conveyor to receive limestone from transfer house conveyor belt and discharge to limestone silo
Dust suppression system	System will spray hopper and transfer house conveyors at loading points
Dust collection system	System will collect dust for hopper and transfer house conveyors loading points and discharge dust back at dust suppression spray points
<i>Other Unit-Related Ancillary Equipment</i>	<ul style="list-style-type: none"> • Piping and Pumps • Special valves and control devices • Instruments • Thermal insulation • Fire protection water supply and sprinklers: extend existing system • Control System: extend existing ABB-Automation Symphony distributed control system
<i>Electricity Generating and Transfer Equipment</i>	
Generator	With the capability to match steam turbine across its operating range: <ul style="list-style-type: none"> • Voltage: 18 kV, nominal • Frequency: 60 Hz • Phase: three, non-salient pole • Other associated equipment • Protection and control systems

TABLE 4.10-1.—Equipment to be Installed for Each Unit (continued)

Equipment Type	Equipment Description
Generator Terminal Equipment	<ul style="list-style-type: none"> • Surge protection (arresters and capacitors) • Excitation voltage transformer (voltage: 18,000/120 volts) • Neutral grounding equipment • Terminations
Isolated Phase Bus	<ul style="list-style-type: none"> • 10,5000 ampere continuous rating, self-cooled • Voltage 18 kV
Transformers	<ul style="list-style-type: none"> • Main transformer: voltage: 17/345 kV with four 2½% full capacity no-load taps • Auxiliary Transformer: voltage: 18,000/4,160 volts with four 2½% full capacity no-load taps
5 kV Metal-Clad Switchgear	
Unit Substations	Load center type with dry type, epoxy cast, self-cooled transformers and air circuit breakers
Breakers	Draw-out type air circuit breakers; 480 volts, with required current and interrupting ratings
Other Protective Equipment	
<i>Other Generator-Related Ancillary Equipment</i>	<ul style="list-style-type: none"> • Motors • Wiring • Control systems • Lighting • Grounding • Telephone system • Transformer fire protection

Source: SCI 2001.

During construction, the proposed 3.5-mile (5.6-kilometer) transmission line would be connected to some of the existing equipment in the substation and to the new electricity generating and transfer equipment detailed in the table above.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. None of the proposed new equipment mentioned in Table 4.10-1 would be ordered or constructed. None of the existing infrastructure would be utilized in conjunction with the Proposed Action and the potential to minimize environmental impacts by using the existing infrastructure would not be realized.

4.10.2 Operation

Proposed Action

Because Units 3 and 4 would be incorporated into an existing coal-burning power station, much of the existing infrastructure of Spurlock Station would be utilized during the operation and maintenance of the two new units. This includes an existing intake structure on the Ohio River that would supply water to the new units with only additional pumps needed. Current maintenance of the piping and basin of the intake structure requires cleaning twice a year. With

the addition of Units 3 and 4, the frequency of cleaning is expected to be reduced because the additional water flow and increase in velocity should flush the debris through the lines to the clarifier. The new units would also utilize the condensate storage tanks that have a storage capacity of 320,000 gallons (1,211,328 liters). With all four units operating at normal makeup, capacity would last 22 hours; with all units operating at maximum makeup, capacity would last 10 hours. The turbine lubricating oil storage tanks and oil centrifuge would also be employed by Units 3 and 4 as well as the two tanks of the ignition fuel oil system that have a capacity of 350,000 gallons (1,324,890 liters). The existing ammonia, hydrogen and carbon dioxide supply system would also be extended to serve Units 3 and 4.

Units 3 and 4 would utilize all existing infrastructure for coal transport, handling, and waste disposal. The barge dock, unloaders, Chesapeake and Ohio railroad tracks and car dumper that convey coal to the site and unload it for Units 1 and 2 would do the same for the coal that would supply Units 3 and 4. With the addition of Units 3 and 4, the current stockpile of low sulfur coal that supplies Units 1 and 2 would be reduced and moved to make room for the creation of a high sulfur coal pile that would supply Units 3 and 4. As stated in Section 4.10.1, Construction, additional conveyor belts would connect the existing coal conveyor system to the new units. Because the high sulfur coal pile would be located adjacent to and within the same land area as the current low sulfur coal pile, the current coal storage holding pond would catch runoff from both piles. The trucks that move the fly ash to the ash landfill and the ash pond that holds the wet bottom ash would all be utilized for Units 3 and 4. Throughput of coal and ash would increase as described in Sections 4.11 and 4.13, Waste Management and Transportation, respectively.

Units 3 and 4 would employ the existing waste treatment facilities that treat all process wastewater from Units 1 and 2. Chemicals used in maintenance, as well as boiler and cooling tower blowdown, would be routed to the existing primary and secondary lagoons for monitoring, treatment, and discharge to the Ohio River. Units 3 and 4 also would use the existing demineralized water system and cycle additive treatment for Units 1 and 2. Plant drains in Units 3 and 4 would discharge to the existing primary plant drain system that is equipped with an oil/water separator to handle potential oil spills. As with Units 1 and 2, the potable water system would be supplied by the city of Maysville and all sanitary wastes from Units 3 and 4 would be discharged to the Maysville Water Treatment Plant. No new outfalls would be added to discharge treated wastewater to the Ohio River and Lawrence Creek.

During operation, the proposed 3.5-mile (5.6-kilometer) transmission line would utilize some of the existing infrastructure of the substation to transfer electricity.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. None of the existing infrastructure would be utilized in conjunction with the Proposed Action and the potential to minimize environmental impacts by using the existing infrastructure would not be realized.

4.11 WASTE MANAGEMENT

This section describes the potential impacts from handling, storage, transportation, and disposal of solid, toxic and hazardous wastes.

Methodology

The waste management impact analysis consists of an evaluation of the impacts generated by the construction and operation of the Proposed Action. Impacts to waste management are described relative to the Affected Environment chapter in Section 3.11, Waste Management.

Potential impacts are qualitatively assessed by comparing current waste management at Spurlock Station to the waste management impacts that may result from the Proposed Action. To determine if an action may cause a significant impact, both the context of the Proposed Action and the intensity of the impact are considered. For actions such as those proposed in this document, the context is the locally affected area and significance depends on the effects in the local area. Impacts would be significant if the Proposed Action would permanently affect waste management in the local area.

4.11.1 Construction

Proposed Action

Under the Proposed Action, EKPC would construct Units 3 and 4 and supporting facilities and a 345-kV transmission line connecting the new units to an existing 345-kV line in Brown County, Ohio. During the construction phase of both units, additional toxic and hazardous chemicals will be used on site. These chemicals include, but are not limited to, fiberglass resins and fillers, solvents, epoxy paints and resins, fuels and material conditioners. The storage and use of these chemicals could create a potential contamination hazard. Spills or leaks of hazardous fluids could contaminate soil and groundwater. This impact of spills or leaks would be minimized or avoided by restricting the location of refueling activities and by requiring immediate cleanup of spills and leaks of hazardous materials. As mentioned earlier, Spurlock Station has a Spill Prevention, Countermeasures, and Control Plan that outlines preventative measures and the steps to be taken in the event of a hazardous material spill.

Oil and diesel fuel would be stored in clearly marked tanks onsite. The tanks would be provided with secondary containment structures. Construction equipment would be maintained regularly, and the source of leaks would be identified and repaired. Any soil contaminated by fuel or oil spills would be removed and disposed of at an approved disposal site. Lubricating oils, acids for equipment cleaning, and concrete curing compounds are potentially hazardous wastes that may be associated with construction activities. These would be placed in containers within secondary containment structures onsite, and disposed of at a licensed treatment and/or disposal facility in accordance with local or state regulations and in compliance with the manufacturer's recommendations. Paint containers would be tightly sealed to prevent leaks or spills. Excess paint would be disposed of consistent with the manufacturer's recommendations and according to applicable governmental regulation.

Construction debris and scrap metal generated during construction would be disposed of at a landfill permitted for this type of waste. Disposal will be in accordance with Federal, state, and local regulations and whenever possible, these wastes will be recycled. Impacts associated with construction of Units 3 and 4 are expected to be minor.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. Potential impacts from Proposed Action construction-related spills of hazardous materials would not occur; however, such potential impacts from the ongoing construction of the selective catalytic reduction for Units 1 and 2 would continue. No additional waste outside of that currently being generated by the ongoing construction of the selective catalytic reduction for Units 1 and 2 would be generated.

4.11.2 Operation

Proposed Action

Under the Proposed Action, the types of waste generated during operation of Units 3 and 4 would be similar to the waste currently generated at the plant and discussed in Section 3.11, Waste Management of the Affected Environment chapter. However, the volume generated of these wastes will increase. By far, the greatest volume of waste generated at Spurlock Station is ash. During operation, Gilbert Unit 3 is expected to generate an average of 694 tons (629,596 kilograms) of fly ash and 374 tons (339,293 kilograms) of bed ash per day at a maximum continuous rating. Unit 4, once constructed, is anticipated to generate similar amounts of ash. Ash from Gilbert Unit 3 would be disposed of at the on-site ash landfill located approximately one mile (1.6 kilometers) from the main plant site. The landfill permit will be modified for a horizontal expansion of Area A and a vertical and horizontal expansion of Areas B and C. The permit modification would increase landfill space by 38,617,217 cubic yards (29.5 million cubic meters). With the current ash generation of Units 1 and 2 and the anticipated operation of the Unit 2 scrubber in the beginning of 2007, the landfill life expectancy would be 80 years. The addition of Units 3 and 4 reduces the life expectancy of the landfill to 37 years.

Because the types of wastes generated from the operation of Units 3 and 4 would be similar to those currently associated with Units 1 and 2, waste handling, storage, and disposal would be as discussed in Section 3.11, Waste Management. The current volumes of hazardous, toxic, and solid wastes would increase with the operation of Units 3 and 4. Spurlock Station is a conditionally exempt small quantity generator of toxic and hazardous wastes. The generator status of the Spurlock Station could change with the addition of Units 3 and 4. If necessary, Spurlock Station would register its new generator status with the Kentucky Department of Environmental Protection. Spurlock Station would implement source reduction and recycling whenever feasible. Recycling and source reduction activities are currently ongoing and would continue with the addition of Units 3 and 4. All wastes would be managed in accordance with applicable Federal, state and local regulations. It is anticipated that the current waste disposal facilities for the Spurlock Station have sufficient capacity to handle the expected volume

increase in waste. Therefore, no adverse impacts from handling, storing, and disposing of the additional Unit 3 and 4 related solid, hazardous and toxic wastes are anticipated.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. The small additional amounts of solid, hazardous and toxic attributed to operation of Units 3 and 4 would not be generated. Similarly, no additional ash would be generated over that currently generated by Units 1 and 2, and thus the life of the landfill would not be shortened.

4.12 OCCUPATIONAL AND PUBLIC HEALTH AND SAFETY

This section presents potential health effects on both workers and the public from the proposed construction and operation of EKPC's Spurlock Station Units 3 and 4, and also from the No Action Alternative.

Methodology

Occupational and public health and safety issues have been evaluated in the context of general air quality, noise, hazardous materials, and accidents. Analysis of the impacts to occupational and public health and safety consists of an evaluation of the effects caused by the construction and operation of the Proposed Action on worker and public health and safety and are described relative to Section 3.12, Occupational and Public Health and Safety. Programs in place at EKPC are designed to minimize public and employee health and safety risks during construction and operation.

4.12.1 Construction

Proposed Action

Worker Health. The level of risk to workers increases in relation to the amount of new construction required. Construction accident risks increase based on the length of the construction period. It is anticipated that peak construction would require 300 to 400 workers and that construction of each unit would take approximately 29 months. Typical worker impacts present in the construction industry would be expected from the construction of the Units 3 and 4. During the construction, compliance with Federal Occupational Safety and Health Administration construction safety standards will be the responsibility of the construction contractor selected for the project. Compliance with these standards will provide for basic standards of worker health and safety during both construction and operation.

Potential health impacts to workers from the Proposed Action include fugitive dust typical of construction sites and noise (see Section 4.1). Construction workers could be exposed to airborne emissions from routine activities such as welding, soldering, grinding, painting, and cleaning operations. These exposures would be intermittent, but may be intense and would be evaluated at the time of construction. Appropriate health and safety measures would be implemented for all identified and anticipated hazards to worker health and safety. Therefore, the potential adverse impacts to worker health and safety during construction would be minimized.

Public Health. Potential health impacts to the public from the Proposed Action include fugitive dust typical of construction sites and noise (see Section 4.1). Since the Spurlock Station is a secure facility, public exposure to typical construction-related potential hazards would not be expected.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. The potential for an

increase in accidents at the Spurlock Station, and the potential for public exposure to additional amounts of fugitive dust and noise, would not occur. However, these types of impacts that are associated with the ongoing construction of the selective catalytic reduction for Units 1 and 2 would continue until construction is complete.

4.12.2 Operation

Worker Health. As discussed in Section 3.12, worker health and safety issues at the Spurlock Station are primarily typical industrial work-related injuries such as bruises, cuts, falls, and repetitive stress injuries. Operation of the two proposed units would probably result in an increase in the number of typical industrial work-related injuries. However, good housekeeping and work-related practices would continue to ensure that the work environment is free of hazards that could result in slips, trips, falls and other injuries. The overall design, layout, and operational protocols of these facilities would minimize human hazards. In addition, EKPC will continue to train all employees that handle, use, transport or have contact with potentially hazardous and toxic materials to reduce exposure and impact to worker health and safety.

Public Health. An accidental release of hazardous or toxic substances to the air or water is the primary health and safety risk to the public from operation of the Spurlock Station. However, there have been no reportable spills of hazardous or toxic substances at Spurlock Station since January 10, 1973 (EKPC 2001). Most of the hazardous and toxic substances used at the site are stored in tanks with secondary containment to contain leaks and spills. While the potential exists for an accidental release of hazardous or toxic substances, Spurlock Station has a Spill Prevention, Control, and Countermeasures Plan in place to minimize adverse impacts from spills and prevent exposure to the public. EKPC also has a facility emergency plan that includes methods for notifying the public and response agencies that a release has occurred. Therefore, operation of the Units 3 and 4 is anticipated to neither increase risk to public health, nor adversely impact public health and safety.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. Therefore, any potential increases in accident rates associated with operation of Units 3 and 4 would not occur. Because operation of the new units is not expected to noticeably increase risks to public health and safety, there would be no noticeable difference between operation of the Proposed Action and the No Action Alternative.

4.12.3 Electric and Magnetic Fields

Current and voltage are necessary to transmit electrical energy by transmission lines. The current, a flow of electric charge measured in amperes, is the source of the magnetic field. The voltage is the source of the electric field and represents the potential for electrical charge to do work. Voltage is measured in volts or one thousand volts, kilovolt (kV). The electric field is a function of voltage carried by conductors and the conductor height aboveground. The magnetic field is a function of the amount of current carried by the line and the height of the conductors.

The possibility of deleterious health effects from electric and magnetic fields exposure has increased public concern in recent years about living near high-voltage power lines. Electric and magnetic fields occur together whenever electricity flows, and as a result, the general practice is to consider both as electric and magnetic fields exposure. The available evidence neither establishes that electric and magnetic fields pose a significant health risk to exposed humans, nor serves as conclusive proof of a definite lack of a risk. A National Institute on Environmental Health Sciences Working Group found limited support for a causal relationship between childhood leukemia and residential exposure to electric and magnetic fields, and between adult chronic lymphocytic leukemia and employment with potentially high-magnetic field exposure. In a 1999 report entitled *Health Effects from Exposure to Power-line Frequency Electric and Magnetic Fields* (NIEHS 1999), the National Institute on Environmental Health Sciences stated that there was weak scientific evidence that exposure to extremely low-frequency electric and magnetic field may pose a leukemia hazard.

Even though electric and magnetic fields are present around appliances and power lines, more recent interest and research have focused on potential health effects of magnetic fields. The U.S. EPA Science Advisory Board has stated that “some epidemiological evidence suggests an association between surrogate measurements of magnetic-field exposures and certain cancer outcomes” (NIEHS nda).

Electric fields are easily shielded or weakened by conducting objects (e.g., trees, buildings, and human skin), but magnetic fields are not. However, both electric and magnetic fields weaken with increasing distance from the source (i.e. conductors) and along a transmission right-of-way. All devices that carry electric current (e.g., televisions, radios, computers) are sources of electric and magnetic fields. The maximum magnetic fields of a transmission line are comparable with the maximum magnetic fields measured near some common household appliances (DOE 2001).

Proposed Action

Operation of the proposed 345-KV transmission line would increase exposure to magnetic fields above current levels for persons living along the right-of-way. In order to quantify the potential magnetic field from the proposed line, measurements of the magnetic field were taken under the existing 345-kV transmission line from Unit 2 at Spurlock Station. Since the proposed transmission line in Brown County would be 345-kV, its magnetic field would be expected to be similar to that measured from the existing line at Spurlock Station.

All measurements were made at a height of 3 feet using an Emdex II Magnetic Field Exposure System, and the load on the unit was 481 megawatts. Magnetic field measurements were taken at five measurement points for three different locations on the transmission line. Two measurements were recorded at each measurement point. A summary of the magnetic field measurements is displayed in Table 4.12-1.

The International Commission on Non-Ionizing Radiation Protection has established guidelines for electric and magnetic fields based on their established effects such as nerve stimulation. These guidelines are not meant to establish electric or magnetic field levels that are safe or unsafe since the available evidence fails to establish a causal link between exposure and adverse health effects (IV 2000).

Table 4.12–1.—Summary of Magnetic Field Measurements for 345-kV Line from Unit 2

Measurement Area	Magnetic Field Measurements Milligauss (mG)		
	75' Left of Center	Center	75' Right of Center
Area #1: At substation fence facing plant	19.8	28.2	14.4
	19.8	27.6	14.4
Area #2: Fence at property line on Route 8 (facing away from plant)	11.8	23.2	12.8
	11.6	23.0	12.8
Area #3: Near AA Highway facing away from plant	15.2	31.8	18.4
	15.4	31.6	18.4

Source: EKPC 2001b.

The guideline established for general public exposure to magnetic fields for up to 24 hours per day is 1,000 mG. For comparison, the highest level measured at the existing 345-kV transmission line at Spurlock Station shown in the table above (31.8 mG under the centerline) multiplied by 24 is approximately 763 mG. Therefore, since this is less than the established guideline, no established effects from exposure to the predicted magnetic field from the proposed transmission line would be expected. Additionally, this measurement was taken below the centerline of the transmission line, an area where extensive human exposure would not be expected.

In summary, while there is uncertainty about the health effects associated with electric and magnetic fields, the following facts have been established from the available information:

- Any exposure-related health risk to the exposed individual will likely be small.
- The most biologically significant types of exposures have not been established.
- Most health concerns are about the magnetic field.

No Federal regulations have been established specifying environmental limits on the strengths of fields from power lines. However, the Federal government continues to conduct and encourage research necessary for an appropriate policy on the electric and magnetic fields issue. Until more definitive evidence is available, little can be said with regard to the conclusions of these studies other than effects, if present, are small.

No Action Alternative

Under the No Action Alternative, Spurlock Station would generate no additional electric or magnetic fields and any increases in exposure to such fields would not occur.

4.13 TRAFFIC AND TRANSPORTATION/AVIATION

This section summarizes the potential impacts related to road, railway, and barge traffic and transportation associated with the construction and operation of the Proposed Action. Impacts to aviation are also presented in this section.

Methodology

The overall impacts have been divided between construction and operational periods. Impacts are analyzed in comparison to traffic data for the region of influence presented in Section 3.5, Water Resources. Recent and estimated road traffic data for routes most likely to be traveled to the project site from the main traffic arteries is presented in Table 3.13–1. For the purposes of presenting a worst-case bounding study, it is assumed that all vehicle trips occur during 12 daylight hours and half of the estimated counts are traveling in each direction. Half of the trips taken in each direction occur during one of two 2-hour commuting periods. The commuting periods are established as 7:30 a.m. to 9:30 a.m. for the morning commute, and 4:30 p.m. to 6:30 p.m. for the evening commute. For example, the year 2001 estimated count given for Kentucky Highway 9 between milepost 13.8 and milepost 14.0 in Mason County is 12,000 vehicle trips per 24-hour period. Based on the assumptions made, all of these vehicle trips would occur during 12 hours of daylight and half of them, or 6,000, are traveling each direction on the road. Half of these 6,000 vehicle trips, or 3,000 trips, occur during the given commuting time for that direction. Established commuting patterns indicate that the morning commute vehicle trips are toward the Cincinnati Metropolitan Area and Maysville, while the evening commute vehicle trips are towards the suburban and rural areas of the region of influence. This analysis assumes that during the morning commute on this section of road, 1,500 vehicle trips per hour are made toward Maysville and during the evening commute, the same number are made heading away from Maysville. During the other 10 hours of daylight, the remaining 3,000 vehicle trips occur in each direction on this section of the highway, resulting in an average of 300 vehicle trips per hour.

The existing data indicate that traffic on each road increases as one travels towards the centers of population of Cincinnati and Maysville. It also indicates that traffic on roads near the project site is relatively light. Based on the 2001 estimated vehicle trips and the methodology established in the previous paragraph, non-commute traffic on local roads in the project vicinity ranges from 6.5 to 35 vehicle trips per hour in each direction.

For the purpose of this analysis, other assumptions are also made. Based on established traffic data throughout the region, it is assumed that each vehicle is occupied by 1.2 individuals. EKPC has estimated that 10 heavy-duty trucks per day will be entering and leaving the site during peak construction periods. Since durations of peak construction have not been indicated and to present a worst-case scenario for traffic impacts to the community and region of influence, it is assumed that 15 trucks per day enter and leave the site throughout the construction of the facility. This would equate to an additional 5 vehicle trips per day on local roads or less than 1 vehicle trips per hour, assuming an 8-hour work day during construction.

Delivery of the major bulk raw materials (coal and limestone) will be by three modes of transportation: truck, rail, and barge. For delivery purposes, a truck is assumed to haul 22 tons (20 metric tons) of cargo per load, a rail car is assumed to haul 110 tons (100 metric tons) of cargo per load, and a river barge is assumed to haul 1,500 tons (1,360 metric tons) per load. Limestone would be delivered by truck, and coal would be supplied as it currently is by both rail and barge.

Each unit would require approximately 2,760 tons (2,504 metric tons) per day of coal for operation as well as approximately 660 tons (599 metric tons) per day of limestone. Trucks carrying limestone would only operate during 6-hour periods for 5 days each week. Fourteen truckloads of limestone per hour would be delivered to the site per day to supply both units. Although coal will not be delivered by truck, for comparison purposes, the amount of coal required to operate Units 3 and 4 would require 1,288 truckloads per hour during the 6-hour delivery window. In this scenario, a total of 7,812 truckloads would be delivered to the site per day to supply coal and limestone to both units. This is equivalent to 15,624 additional vehicle trips in and out of the site per day of operation. It is obvious that coal delivery by truck is not feasible.

The rail car equivalents to supply both of the new units would be 50.2 rail cars of coal per day and 12 rail cars of limestone per day, or a total of 62.2 rail cars per day of operation. The river barge equivalents would be 2.7 barges per day. It is envisioned that limestone deliveries would be made via truck. Fly and bed ash will be disposed of by truck onsite and will require 8.4 truck trips per hour. The ash disposal trucks would operate 7 hours a day, 7 days a week.

4.13.1 Construction

Proposed Action

During construction, 150 to 250 workers will commute to the site from the Cincinnati Metropolitan Area. This will be in addition to the 150 construction workers that are currently making this commute while working on Units 1 and 2 at the Spurlock Station. To provide a bounding estimate of a worst-case scenario, it is assumed that peak levels would be employed throughout the 58-month construction period. An additional 208 vehicle trips would be required during each commuting period to accommodate the 250 workers required. This would cause a significant increase (over 25 percent on each road segment) in vehicle trips taken on roads immediately surrounding the project site; however, existing traffic levels are light and no congestion should result. Kentucky Highway 9 would experience slight increases in vehicle trips that may contribute to existing congestion during rush hour periods. These impacts may not occur on a daily basis; however, as workers may opt to find weekly housing local to Maysville due to its distance from Cincinnati, they would likely only make the trip to Cincinnati during the weekends. The greater the number of workers who select this option, the lower the impact would be to Kentucky Highway 9. Conversely, local traffic in Maysville would increase during the week as these workers travel to the project site from their local residences. Individuals traveling to the indirect jobs created by the project will also contribute additional vehicle trips throughout the region of influence.

Construction vehicles would use local roads on a limited basis. The majority of the construction vehicles and trucks delivering material to the project site would utilize Kentucky Highways 8 and 10 in Mason County. The limited usage would not significantly impact traffic, yet slight delays may occur to vehicles traveling along these routes. The majority of the construction vehicles would remain onsite throughout the project and the majority of construction material would be delivered via river barge. This would result in a slight increase in Ohio River traffic at the two locks nearest the project site. The extra barges would be scheduled in a manner that would not disrupt current river traffic or result in delays on the river. The site has a barge docking facility specifically designed for construction material. This docking facility would allow for the unloading of material without localized disruptions to Ohio River traffic. Rail use is not expected during construction and no impacts would result. No impacts are expected to aviation during construction.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. No traffic and transportation impacts would occur because no additional construction would take place. Traffic and transportation would be expected to remain as described in the affected environment, Section 3.13. Because no impacts would be expected to aviation during construction of the Proposed Action, there would be no noticeable difference between the Proposed Action and the No Action Alternative concerning aviation.

4.13.2 Operation

Proposed Action

After the construction of the new units, 50 new workers would be added to the current operational staff of 159 employees at the Spurlock Station. These workers would come from local communities within Mason County, Kentucky and Brown County, Ohio. An additional 42 vehicle trips would be required at both the beginning and end of shift periods to accommodate the additional workers. Since the plant is operated 24 hours a day, 7 days a week, these vehicle trips would be spread out throughout the week. Assuming a three-shift workday, 20 additional vehicle trips would be required during an average shift change. This is not a significant change in current traffic levels near the project site and within the town of Maysville.

Operation of the additional units will require an increase in local truck traffic. EKPC states that trucks will only operate during six-hour periods on weekdays, in order to minimize impacts to local traffic. These 6-hour periods would occur in the middle of the day to avoid possible rush hour congestion. In order to operate the new units and keep enough coal supplied onsite, 1,302 truckloads would need to enter the site each hour during the 6-hour periods of truck operation. This equates to roughly one truck every 3 seconds. It is readily apparent that this is not logistically possible and, therefore, EKPC will only deliver the required limestone supply via truck. This will require 14 trucks per hour during the 6-hour truck operation period or approximately one truck every 4 minutes. These deliveries will represent a significant increase in truck traffic on roads near the project site and may cause some delays as large trucks travel

slower than most other vehicles. This traffic would only occur during mid-day hours to minimize the overall impact on local roads.

The facility would also require the use of trucks to dispose of the bed and fly ash generated during operation of the two new units. These trucks would operate 7 hours a day, 7 days a week and would require 8.4 truckloads per hour, or one truck every 7 minutes. The ash disposal would take place entirely onsite and would not present any additional impacts to local roads.

EKPC will supply the coal to operate the two new units via both barge and rail. Twenty-five unit trains of 100 cars each per year, or about 1 unit train every 2 weeks are expected. Although this is not a large increase in train traffic, train deliveries would be scheduled with CSX Transportation, Inc., to accommodate current rail traffic and avoid delays throughout the rail system. The existing site rail infrastructure is sufficient to accommodate a full unit train during unloading, thus avoiding delays on the main line.

For the coal supplied by river barge, an additional 9 to 10 barges per week per unit are expected. For each unit, this would result in a 1.7 percent annual increase in coal tonnage shipped through the Greenup Lock and Dam. The extra barges would be scheduled in a manner that would not disrupt current river traffic or result in delays on the river. The site has a barge docking facility specifically designed for the large deliveries required to operate the two new units. This docking facility would allow for the unloading of material without localized disruptions to Ohio River traffic.

The Federal Aviation Administration regulates the height of facility stacks at the project site. The maximum height allowed is 805 feet (246 meters). The stacks for the current units at the site are at the maximum allowable height. The new stacks for Units 3 and 4 will be 720 feet (219 meters) tall. Since the new stacks will be built below the established height requirement and the height of the existing stacks, no aviation impacts are expected.

No Action Alternative

Under the No Action Alternative considered in this environmental assessment, Units 3 and 4 at Spurlock Station and the associated transmission line would not be built. Increases in truck traffic associated with limestone deliveries would not occur. Similarly, increases in barge and train traffic associated with coal deliveries would not occur. Because no impacts would be expected to aviation during operation of the Proposed Action, there would be no noticeable difference between the Proposed Action and the No Action Alternative concerning aviation.

5.0 CUMULATIVE EFFECTS

There is increasing evidence that the most significant environmental effects may not result from the direct effects of a particular action, but from the combination of individually minor effects of multiple actions over time (CEQ 1997). The Council on Environmental Quality regulations implementing the procedural provisions of the *National Environmental Policy Act* define cumulative effects as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions” (40 CFR 1508.7). The regulations further explain “cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.”

Methodology

The cumulative effects analysis qualitatively presented in this document is based on the potential effects of the addition of Units 3 and 4 at the Spurlock Station and the construction of a transmission line extending into Brown County, Ohio, when added to similar impacts from other projects in the region. In the previous resource descriptions and impacts analysis, Chapters 3 and 4, the potential environmental effects of the Proposed Action and the No Action Alternative were evaluated with respect to existing conditions or “background.” This takes into account past and present actions in the vicinity of the project. Therefore, discussions in this chapter center on the potential effects of reasonably foreseeable future actions in the region of influence. As the construction of each unit of the Proposed Action would be concluded within a period of 29 months, the cumulative effects analysis focuses on the post-construction (operation) period of the project, which coincides with other reasonably foreseeable future actions.

An inherent part of the cumulative effects analysis is the uncertainty surrounding actions that have not yet been fully developed. The Council on Environmental Quality regulations provide for the inclusion of uncertainties in the EIS analysis and state that “when an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking” (40 CFR 1502.22). The Council on Environmental Quality regulations do not state that the analysis cannot be performed if the information is lacking. Consequently, the analysis contained in this section includes actions that could be reasonably anticipated to occur during the lifetime of the Units 3 and 4 Project, likely to have cumulative effects within the region of influence.

In evaluating each of the resource areas for cumulative effects, focus is given to those which are likely to be impacted throughout operation of the project and thus could be cumulatively affected by other activities. This narrowing of the scope of analysis supports the intent of the NEPA process that is “to reduce paperwork and the accumulation of extraneous background data; and to emphasize real environmental issues and Alternatives”(40 CFR 1500.2[b]).

Cumulative Analysis

The primary cumulative effects from the combination of EKPC's Proposed Action and other reasonably foreseeable actions are a result of added pressure on environmental resources from industry and development. The resources that may have cumulative effects from the combination of EKPC's Proposed Action and other reasonably foreseeable actions are air and visual resources. The region of influence considered for the cumulative effects analysis is an approximately 360 square mile (932 square kilometer) region centered on Spurlock Station.

The following reasonably foreseeable actions are considered in the cumulative effects analysis:

Electricity Supply Projects. The air quality analysis performed for the PSD review includes both the emissions of all existing sources in the area, and emissions from proposed sources that have submitted a complete PSD application. Thus, any reasonably foreseeable projects (i.e., those that have submitted a complete PSD application) are already included in the PSD analysis for comparison with the NAAQS. Refer to Section 4.1 for details of the NAAQS analysis. An assessment of the potential cumulative effects to air and visual resources from future electricity supply projects is included below.

Industry Development. It is reasonably foreseeable that further industrial development, such as industrial parks and manufacturing facilities, may occur along the Ohio River within the region of influence. The availability of river water for process use and for transportation has historically attracted industrial development to the area, and may continue to do so. However, as described above, reasonably foreseeable proposed major industrial air emission sources have already been included in the PSD analysis for the NAAQS. To the extent that industrial development continues along the Ohio River in the region of influence, the potential for cumulative effects to air and visual resources is evaluated below.

Effects on Air Quality

As described above, the air quality analysis performed for the PSD review includes both the emissions of all existing sources in the area, and emissions from proposed sources that have submitted a complete PSD application. Thus, any reasonably foreseeable projects (i.e., those that have submitted a complete PSD application) are already included in the PSD analysis for comparison with the NAAQS. Table 4.1–4 shows the 5-year maximum impact from the proposed sources and all other PSD sources to be 83 percent of the NAAQS (for the SO₂, 24-hour standard). It should be noted that a number of steps in the modeling protocol introduces conservatism into the modeling results, thus assuring the absolute maximum impacts are predicted or over-predicted. For example, maximum emission rates are used for all emission points, assuming the maximum firing rate and maximum annual hours of operation. The modeled maximum impacts are based on the worst-case meteorological conditions for impacts selected from the 5 years of data. The maximum modeled impact is added to the maximum background pollutant concentrations, although the weather conditions that produce the highest impacts often do not coincide with the weather producing the highest background concentrations. Therefore, for electricity generation or industrial sources that may be built within the region of

influence in the future, an adequate margin of safety remains below the NAAQS established by EPA to protect public health.

Effects on Visual Resources

Visual resources may have adverse cumulative effects as a result of reasonably foreseeable projects. A trend towards development of the natural landscape could occur. The cumulative effects on the visual environment would be increased fragmentation of the Ohio River viewshed. This cumulative effect can be mitigated by grouping landscape disturbances together, such as is proposed for this project by expanding an existing power plant and routing the proposed transmission line right-of-way adjacent to an existing transmission line. Therefore, the cumulative effect on the viewshed in the Spurlock Station area is not considered to be significant.

6.0 APPLICABLE ENVIRONMENTAL REGULATIONS AND PERMITS

This section identifies and summarizes the major Federal, state and local laws, regulations, and requirements that may apply to the Proposed Action in this environmental assessment.

6.1 LAWS, REGULATIONS, AND EXECUTIVE ORDERS

The major Federal laws, regulations, Executive Orders, and other compliance actions that potentially apply to the Proposed Action are identified in Table 6.1–1. In addition, certain environmental requirements have been delegated to State authorities for enforcement and implementation. These and other state regulations are identified in Table 6.1–2. It is EKPC's policy to conduct its operations in an environmentally safe manner and in compliance with all applicable statutes, regulations, and standards. Although this chapter does not address pending legislation or future regulations, EKPC recognizes that the regulatory environment is subject to changes, and that the construction and operation of the Proposed Action must be conducted in compliance with all applicable regulations and standards.

6.2 REGULATORY ACTIVITIES

New permits and approvals would be needed before the Proposed Action could be constructed. Permits regulate many aspects of facility construction and operations, including the quality of construction, treatment and storage of hazardous materials, and discharge of effluents to the environment. These permits would be obtained as required from appropriate Federal, state and local agencies.

TABLE 6.1-1.—Federal Environmental Statutes, Regulations and Orders

Category	Statute/ Regulation/Order	Citation	Responsible Agency	Permits, Approvals, Consultations, and Notifications
Air Resources	Clean Air Act (CAA) As amended	42 USC §§ 7401 et seq.	EPA	Requires sources to meet standards and obtain permits to satisfy: National Ambient Air Quality Standards (NAAQS), State Implementation Plans, Standards of Performance for New Stationary Sources, National Emission Standards for Hazardous Air Pollutants (NESHAP), and Prevention of Significant Deterioration.
	National Ambient Air Quality Standards/State Implementation Plans	42 USC §§ 7409 et seq.	EPA	Requires compliance with primary and secondary ambient air quality standards governing sulfur dioxide, nitrogen oxide, carbon monoxide, ozone, lead, and particulate matter and emission limits/reduction measures as designated in each state's implementation plan.
	Standards of Performance for New Stationary Sources	42 USC §§ 7411 et seq.	EPA	Establishes control/emission standards and recordkeeping requirements for new or modified sources specifically addressed by a standard.
	National Emission Standards for Hazardous Air Pollutants	42 USC §§ 7412 et seq.	EPA	Requires sources to comply with emission levels of carcinogenic or mutagenic pollutants; may require a preconstruction approval, depending on the process being considered and the level of emissions that will result from the new or modified source.
	Prevention of Significant Deterioration	42 USC §§ 7470 et seq.	EPA	Applies to areas that are in compliance with NAAQS. Requires comprehensive preconstruction review and the application of Best Available Control Technology to major stationary sources (emissions of 100 t/year) and major modifications; requires a preconstruction review of air quality impacts and the issuance of a construction permit from the responsible state agency setting forth emission limitations to protect the Prevention of Significant Deterioration increment.
	Noise Control Act of 1972	42 USC §§ 4901 et seq.	EPA	Requires facilities to maintain noise levels that do not jeopardize the health and safety of the public.

TABLE 6.1-1.—Federal Environmental Statutes, Regulations and Orders (continued)

Category	Statute/ Regulation/Order	Citation	Responsible Agency	Permits, Approvals, Consultations, and Notifications
Water Resources	Clean Water Act (CWA)	33 USC §§ 1251 et seq.	EPA	Requires EPA or state-issued permits and compliance with provisions of permits regarding discharge of effluents to surface waters.
	National Pollutant Discharge Elimination System (NPDES) (Section 402 of CWA)	33 USC §§ 1342 et seq.	EPA	Requires permit to discharge effluents (pollutants) and stormwaters to surface waters; permit modifications are required if discharge effluents are altered.
	Nationwide Permit #12 (Section 404 Permit) (Section 404 of the CWA)	33 USC §§ 1344 et seq.	U.S. Army Corps Of Engineers	Requires any group (business or government) working within the 100-year floodplain to obtain a Nationwide Permit (known as a 404 Permit) if there is the potential for any dredge or fill material to be discharged into the nation's waterways.
	Section 401 Water Quality Certification	33 USC §§ 1341 et seq.	U.S. Army Corps Of Engineers	Requires that States issue or waive a state Section 401 Water Quality Certificate prior to issuance of a Section 404 permit by the US Army Corps of Engineers.
	Water Quality Standards and Implementation Plans (Section 303(d) of CWA)	33 USC §§ 1313 et. seq.	EPA	Requires states to develop a list of waterbodies not supporting designated uses.
	Executive Order 11988: Floodplain Management	3 CFR, 1977 Comp., p. 117	Water Resources Council, Federal Emergency Management Agency, Council on Environmental Quality	Requires consultation if project impacts a floodplain.

TABLE 6.1-1.—Federal Environmental Statutes, Regulations and Orders (continued)

Category	Statute/ Regulation/Order	Citation	Responsible Agency	Permits, Approvals, Consultations, and Notifications
Water Resources (continued)	Executive Order 11990: Protection of Wetlands	3 CFR, 1977 Comp., p. 117	Water Resources Council, Council on Environmental Quality	Requires Federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative.
Soil Resources	Farmland Protection Policy Act of 1981	7 USC §§ 4201 et seq.	Natural Resources Conservation Service	Federal agencies shall avoid any adverse effects to prime and unique farmlands.
Biological Resources	Endangered Species Act of 1973	16 USC §§ 1531 et seq.	USFWS/ National Marine Fisheries Service	Requires consultation to identify endangered or threatened species and their habitats, assess impacts thereon, obtain necessary biological opinions, and, if necessary, develop mitigation measures to reduce or eliminate adverse effects of construction or operations.
Cultural Resources	National Historic Preservation Act of 1966, as amended	16 USC §§ 470 et seq.	President's Advisory Council on Historic Preservation	Requires Federal agencies to consult with the State Historic Preservation Office (SHPO) prior to construction to ensure that no historical properties will be affected for Federal or federally assisted projects.
	Archaeological and Historical Preservation Act of 1974	16 USC §§ 469 et seq.	Department of the Interior	Requires Federal agencies to obtain authorization for any disturbances of archaeological resources.
	Antiquities Act	16 USC §§ 431-433	Department of the Interior	Requires Federal agencies to comply with all applicable sections of the Act.
	Executive Order 11593: Protection and Enhancement of the Cultural Environment	3 CFR 154, 1971- 1975 Comp., p. 559	Department of the Interior	Requires Federal agencies to aid in the preservation of historic and archeological data that may be lost during construction activities.
Worker Safety and Health	Occupational Safety and Health Act (OSHA)	5 USC §§ 5108	OSHA	Requires agencies to comply with all applicable work safety and health legislation (including guidelines of 29 CFR 1960) and prepare, or have available, Material Safety Data Sheets.

TABLE 6.1-1.—Federal Environmental Statutes, Regulations and Orders (continued)

Category	Statute/ Regulation/Order	Citation	Responsible Agency	Permits, Approvals, Consultations, and Notifications
Hazardous Substances	Hazard Communication Standard	29 CFR 1910.1200	OSHA	Requires employers to ensure that workers are informed of, and trained to handle all chemical hazards in the workplace.
	Resource Conservation and Recovery Act	42 USC § 6901 et seq.	EPA	Regulates the treatment, storage, and disposal of hazardous wastes. The Environmental Protection Agency implementing guidance for the Act is in 40 CFR § 260-272.
	Emergency Planning and Community Right-To-Know Act of 1986	42 USC §§ 11001 et seq.	EPA	Requires the development of emergency response plans and reporting requirements for chemical spills and other emergency releases, and imposes right-to-know reporting requirements covering storage and use of chemicals which are reported in toxic chemical release forms.
Aviation Impacts	Pollution Prevention Act of 1990	42 USC §§ 11001-11050	EPA	Establishes a national policy that pollution should be reduced at the source and requires a toxic chemical source reduction and recycling report for an owner or operator of facility required to file an annual toxic chemical release form under section 313 of SARA.
	Objects Affecting the Navigation Space	14 CFR 77	Federal Aviation Administration	Provisions of these regulations specify the criteria used by the Federal Aviation Administration (FAA) for determining whether a “Notice of Proposed Construction or Alteration” is required for potential obstruction hazards. The need for such a notice depends on factors related to the height of the structure, the slope of an imaginary surface from the end of nearby runways to the top of the structure, and the length of the runway involved.
	Proposed Construction and/or Alteration of Objects that May Affect the Navigation Space	FAA Advisory Circular (AC) No. 70/460-2H	Federal Aviation Administration	This circular informs each proponent of a project that could pose an aviation hazard of the need to file the “Notice of Proposed Construction or Alteration” (Form 7640) with the FAA.
	Obstruction Marking and Lighting	FAA AC No. 70/460-1G	Federal Aviation Administration	This circular describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR.

TABLE 6.1-1.—Federal Environmental Statutes, Regulations and Orders (continued)

Category	Statute/ Regulation/Order	Citation	Responsible Agency	Permits, Approvals, Consultations, and Notifications
Other	Radio Frequency Device, Kits	47 CFR 15.25	Federal Communications Commission	Provisions of these regulations prohibit operation of any devices producing force fields, which interfere with radio communications, even if (as with transmission lines) such devices are not intentionally designed to produce radio-frequency energy. The FCC requires each line operator to mitigate all complaints about interference on a case-specific basis. Staff usually recommends specific conditions of certification to ensure compliance with this FCC requirement.
	National Environmental Policy Act (NEPA)	42 USC §§ 4321 et seq.	Council on Environmental Quality	Requires Federal agencies to comply with NEPA implementing procedures in accordance with 10 CFR 1021.
	Rural Utilities Service, USDA: Environmental Policies and Procedures	7 CFR § 1794 et seq.	Rural Utilities Service	Requires the Rural Utilities Service to comply with the National Environmental Policy Act and certain related Federal environmental laws, statutes, regulations and Executive Orders that apply to the agency's programs and administrative actions.
	Executive Order 11514: Protection and Enhancement of Environmental Quality	3 CFR, 1966-1970 Comp., p.902	Council on Environmental Quality	Requires Federal agencies to demonstrate leadership in achieving the environmental quality goals of NEPA; provides for agency consultation with appropriate Federal, state, and local agencies in carrying out their activities as they affect the environment.
	Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations	February 11, 1994	Environmental Protection Agency	Requires Federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.

TABLE 6.1-2.--State Environmental Statutes, Regulations and Orders

Category	Statute/ Regulation/Order	Citation	Responsible Agency	Permits, Approvals, Consultations, and Notifications
Air Resources	Construction/Operation Air Permit	KRS 224.10-100, 224.20-201 401 KAR 50:035	Kentucky Division for Air Quality	Implements Federal and state air quality standards. Developed a State Implementation Plan that contains the rules and permitting requirements developed to assure maintenance of the NAAQS. EKPC has filled for a construction/operating permit to fulfill both Kentucky requirements and Federal PSD Construction and Title V Operating Permit.
Water Resources	Kentucky Pollutant Discharge Elimination System (KPDES) Permitting Program	KRS 224.16-50 401 KAR 5:050-5:080	Kentucky Division of Water	Administers the Federal NPDES program that requires permits containing effluent standards for the discharge of pollution into the surface waters of Kentucky. EKPC would modify its current KPDES permit to reflect the additional wastewater quantities generated by Units 3 and 4 of the Proposed Action.
	KPDES Permit for Storm Water Discharges	401 KAR 5:002 et seq.	Kentucky Division of Water	Issues a KPDES permit for storm water discharges for construction on industrial sites if more than 5 acres (2 hectares) is disturbed.
	Ohio NPDES Permit for Storm Water Discharges – Construction Storm Water	Ohio Revised Code (ORC) 61:11 Ohio Administrative Code (OAC) 3745-38	Ohio Environmental Protection Agency	Issues a NPDES permit for storm water discharges for construction on industrial sites if more than 5 acres (2 hectares) is disturbed.
	Floodplain Construction Permit	KRS 151.125, 151.230 401 KAR 4:060	Kentucky Division of Water	Issues a Floodplain Construction Permit prior to any construction or other activity in or along a stream that could in any way obstruct flood flows. EKPC would be required to file for this permit for any construction in the floodplain.
	Section 401 Water Quality Certification (Section 401 CWA)	KRS 224.16-050 401 KAR Chapter 5.	Kentucky Division of Water	Administers Federal Clean Water Act and issues a Section 401 Water Quality Certification prior to issuance of any federal license or permit to conduct any activity that may result in any discharge into waters of the Commonwealth of Kentucky. Directly tied to Section 404 Permit issued by the US Army Corps of Engineers for physical impacts to streams and wetlands. EKPC would be required to apply for this certification.

TABLE 6.1-2.—State Environmental Statutes, Regulations and Orders (continued)

Category	Statute/ Regulation/Order	Citation	Responsible Agency	Permits, Approvals, Consultations, and Notifications
	Section 401 Water Quality Certificate (Section 401 CWA)	ORC Chapters 119 and 6111 OAC Chapters 3745- 1,3745-32, and 3745- 47	Ohio Environmental Protection Agency	Administers Federal Clean Water Act and issues a Section 401 Water Quality Certification prior to issuance of any federal license or permit to conduct any activity that may result in any discharge into waters of the state of Ohio. Directly tied to Section 404 Permit issued by the US Army Corps of Engineers for physical impacts to streams and wetlands. EKPC may be required to apply for this certification.
Solid Waste	Solid Waste Landfill Permits (Construction and Operation)	KRS 224.10-100, 224.40-100, 224.40- 305, 224.40-310 401 KAR 47:100, 47:160.	Kentucky Division of Waste Management	Administers Federal Resource Conservation and Recovery Act regulatory programs for Kentucky's solid, special, and hazardous wastes and underground storage and solid waste landfills. EKPC is currently modifying its Solid Waste Permit to expand the ash landfill.
Public Utility Commission Certification	Certificate of Public Convenience and Necessity/ Certificate of Environmental Compatibility for Construction	807 KAR 5 et seq. KRS 278.020	Kentucky Public Service Commission	Issues a Certificate of Public Convenience and Necessity and a Certificate of Environmental Compatibility for Construction before construction. EKPC has filed for and received these certificates.
	Certificate of Environmental Compatibility and Public Need	Ohio Revised Code: Chapter 4906 OAC: Chapter 4906	Ohio Power Siting Board	Issues a Certificate of Environmental Compatibility and Public Need before construction. EKPC has yet to file for this certificate.

7.0 UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS

The construction and operation of the Proposed Action would result in some unavoidable adverse impacts. Impacts to residential areas located near the proposed facilities during construction would include increases in daytime noise and fugitive dust, as well as traffic detours. Residences closest to the construction would experience noise levels up to 20 dBA above background during the construction phase. Since these impacts are associated with the construction phase, they would be short-term and temporary. Residences closest to Gilbert Unit 3 could experience an increase in noise of up to 10 dBA above the measured background noise level from the operation of the proposed facility. This level of change in sound levels may be perceived as “dramatic” by these residents.

Construction and operation of the Units 3 and 4 would result in the generation of large quantities of ash that would decrease the life of the existing on-site ash landfill.

Construction of the proposed transmission line in Brown County, Ohio would cause loss of, and/or disturbance to, existing native plant communities and loss of habitat for terrestrial animal populations. Physical disturbance of terrestrial animal species is expected in most cases to be temporary, and the loss of habitat would be negligible given that remaining in the surrounding area.

The Ohio River Scenic Route, which includes the section of Highway 52 in the proposed project area, has been designated as a National Scenic Byway. The proposed Units 3 and 4 stacks, which are 720-feet (219 meters) tall, and steam emissions from the cooling tower system could be considered an adverse impact on the viewshed to travelers on Highway 52 and the Ohio River. The construction of proposed transmission line could have a similar effect. Other visual changes to the viewshed from the operation of Units 3 and 4 include increased barge and truck traffic associated with coal and limestone deliveries.

8.0 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

This section describes the irreversible and irretrievable commitments of resources associated with implementation of the Proposed Action. A commitment of resources is irreversible when its primary or secondary impacts limit the future options for a resource. An irretrievable commitment refers to the use or consumption of a resource that is neither renewable nor recoverable for use by future generations.

Irreversible commitments of resources for the proposed transmission line would result in the conversion of approximately 41 acres (16.5 hectares) of primarily forested land, into non-forested land for the proposed transmission line right-of-way in Ohio. Some disturbance of cropland would also occur during construction of the transmission line, but only the land directly lost to the foundations of the transmission line structures would be irreversibly committed.

Construction of the proposed Units 3 and 4 and 345-kV transmission line in Brown County, Ohio would require the irretrievable commitment of standard building materials and fuel for construction equipment. Resources irretrievably committed for operation of this project would be consumption of 2,760 tons (2,503 metric tons) of coal per day and 660 tons (599 metric tons) per day of limestone; consumption of an additional 8.64 MGD (32.7 MLD) of surface water, although 2.2 MGD (8.3 MLD) of this water would be returned to the Ohio River after treatment; and relatively minor quantities of fuel for maintenance vehicles, operating supplies, and miscellaneous chemicals.

9.0 RELATIONSHIP BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE OF LONG-TERM PRODUCTIVITY

The potential impacts of the Proposed Action are discussed in Chapters 4 and 5 of this environmental assessment. Although the Proposed Action does not require a major amount of land to be taken out of production, losses of terrestrial plant and animal species and habitats from natural productivity to accommodate the proposed transmission line are possible during construction. Land clearing and construction activities resulting in personnel and equipment moving about an area would disperse wildlife and temporarily eliminate habitats. Short-term disturbances of previously undisturbed habitats from the construction of the proposed transmission line in Brown County, Ohio and conversion of these lands to a right-of-way could cause long-term reductions in the biological productivity of the areas directly impacted.

10.0 LIST OF AGENCIES AND PERSONS CONTACTED

Certain statutes and regulations require EKPC to conduct consultations with Federal, state and local agencies regarding the potential for the proposed project to disturb sensitive resources. These consultations are related to biological, cultural and soil resources and are generally required before any land disturbance can begin. Biological resource consultations generally pertain to the potential for activities to disturb sensitive species or habitats. Cultural resource consultations pertain to the potential for destruction of important cultural or archeological sites. Soil resource consultations pertain primarily to the temporary or permanent displacement of prime or unique farmland.

Consultations with Federal and state agencies have been initiated regarding the potential of the proposed project to disturb sensitive resources. Agencies and personnel contacted are shown in Table 10–1 and Appendix B contains copies of the various consultation letters sent. Information from the agencies has been incorporated into Chapters 3 and 4 as appropriate. All agencies will be provided with a copy of the Draft Gilbert Units 3 and 4 Environmental Assessment.

TABLE 10–1.—Summary of Consultation Letters

Subject	Agency Name	Individual Name	Date of Letter
Biological	United States Fish and Wildlife Service		
	Field Office:		
	Reynoldsburg, Ohio Cookville, Tennessee	Ms. Megan Sullivan Mr. Jim Widlak	October 8, 2001 November 1, 2001
Soil	United States Department of Agriculture, Natural Resources Conservation Service		
	Field Office:		
	Maysville, Kentucky Georgetown, Ohio	Mr. Joel LeGris Mr. Ed Campbell	October 5, 2001 October 5, 2001
Cultural	Kentucky Heritage Council, The State Historic Preservation Office	Mr. Charles Hockensmith	July 17, 2001
	The Ohio Historical Society, Ohio Historic Preservation Office	Not Yet Identified	NA

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12.0 GLOSSARY

Advisory Council on Historic Preservation: A 19-member body appointed to advise the President and Congress in the coordination of actions by Federal agencies on matters relating to historic preservation.

Aeolian: Borne, deposited, produced, or eroded by the wind.

Aesthetics: Referring to the perception of beauty.

Affected environment: Existing biological, physical, social, and economic conditions of an area subject to change, both directly and indirectly, as the result of a proposed human action.

Air dispersion modeling: a mathematical simulation, usually computer-generated, of how gases, vapors, or particles disperse into the air.

Air pollutant: Generally, an airborne substance that could, in high enough concentrations, harm living things or cause damage to materials. From a regulatory perspective, an air pollutant is a substance for which emissions or atmospheric concentrations are regulated or for which maximum guideline levels have been established due to potential harmful effects on human health and welfare.

Air quality: Generally, an airborne substance that could, in high enough concentrations, harm living things or cause damage to materials. From a regulatory perspective, an air pollutant is a substance for which emissions or atmospheric concentrations are regulated or for which maximum guideline levels have been established due to potential harmful effects on human health and welfare.

Air Quality Control Region (AQCR): Geographic subdivisions of the United States established to regulate pollution on a region or local level. Some regions span more than one state.

Air Quality Standards: The level of pollutants prescribed by regulation that may not be exceeded during a specified time in a defined area.

Alluvial deposits: Deposits of earth, sand, gravel, and other materials carried by moving surface water deposited at points of weak water flow.

Ambient air: Any unconfined portion of the atmosphere; open air, surrounding air. That portion of the atmosphere, external to buildings, to which the general public has access.

Amperes: Measure of the flow of electric current; source of a magnetic field.

Aquifer: A body of rock or sediment in a formation, group of formations, or part of a formation that is saturated and sufficiently permeable to transmit economic quantities of water to wells and springs.

Archaeological sites (resources): Any location where humans have altered the terrain or discarded artifacts during either prehistoric or historic times.

Archaeology: A scientific approach to the study of human ecology, cultural history, and cultural process.

Artifact: An object produced or shaped by human workmanship of archaeological or historical interest.

Attainment area: An area which the U.S. Environmental Protection Agency (EPA) has designated as being in compliance with one or more of the National Ambient Air Quality Standards (NAAQS) for sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and particulate matter. Any area may be in attainment for some pollutants but not for others.

Atmospheric dispersion: The process of air pollutants being dispersed into the atmosphere. This occurs by the wind that carries the pollutants away from their source and by turbulent air motion that results from solar heating of the Earth's surface and air movement over rough terrain and surfaces.

Auxiliary transformer: A backup transformer.

Background noise: The total acoustical and electrical noise from all sources in a measurement system that may interfere with the production, transmission, time averaging, measurement, or recording of an acoustical signal.

Baseload: Within the alternatives, this refers to operating the hydropower system to maximize baseload energy production. Baseload power plants have high capacity factors meaning they operate much of the time.

Bounding: A credible upper limit to consequences or impacts.

Breaker: A switching device that is capable of closing or interrupting an electrical circuit under over-load or short-circuit conditions as well as under normal load conditions.

Bus: A set of two or more electrical conductors that serve as common connections between load circuits and each of the phases (in alternating current systems) of the source of electric power.

Candidate species: A species of plant or animal for which there is sufficient information to indicate biological vulnerability and threat, and for which proposing to list as "threatened" or "endangered" is or may be appropriate.

Capability: The maximum load that a generator, turbine, transmission circuit, apparatus, station, or system can supply under specified conditions for a given time interval, without exceeding approved limits of temperature and stress.

Capacity: The load for which a generator, turbine, transformer, transmission circuit, apparatus, station, or system is rated. Capacity is also used synonymously with capability.

Carbon monoxide (CO): A colorless, odorless gas that is toxic if breathed in high concentrations over a period of time. It is formed as the product of the incomplete combustion of hydrocarbons (fuel).

Class I, II, and III Areas: Area classifications, defined by the *Clean Air Act*, for which there are established limits to the annual amount of air pollution increase. Class I areas include international parks and certain national parks and wilderness areas; allowable increases in air pollution are very limited. Air pollution increases in Class II areas are less limited, and are least limited in Class III areas. Areas not designated as Class I start out as Class II and may be reclassified up or down by the state, subject to federal requirements.

Clean Air Act (CAA): (42 U.S. Code 7401 et seq.) Establishes (1) national air quality criteria and control techniques (Section 7408); (2) National ambient air quality standards (Section 7409); (3) state implementation plan requirements (Section 4710); (4) federal performance standards for stationary sources (Section 4711); (5) national emission standards for hazardous air pollutants (Section 7412); (6) applicability of CAA to federal facilities (Section 7418), i.e., Federal agency must comply with federal, state, and local requirements respecting control and abatement of air pollution, including permit and other procedural requirements, to the same extent as any person; (7) federal new motor vehicle emission standards (Section 7521); (8) regulations for fuel (Section 7545); (9) aircraft emission standards (Section 7571).

Clean Water Act: (33 U.S. Code 1251 et seq.) Restores and maintains the chemical, physical, and biological integrity of the nation's waters.

Climatology: The science that deals with climates and investigates their phenomena and causes.

Code of Federal Regulations (CFR): All Federal regulations in force are published in codified form in the Code of Federal Regulations.

Combined-Cycle Generation Facility The combination of a gas turbine and a steam turbine in an electric generation plant. The waste heat from the gas turbine provides the heat energy for the steam turbine.

Combustion turbine: Turbine operating on fuels that are capable of converting heat energy into electrical energy.

Community (biotic): All plants and animals occupying a specific area under relatively similar conditions.

Compressor: A machine, especially a pump, for compressing air, gas, etc.

Conservation: A reduction in electric power consumption as a result of increases in the efficiency of energy use, production, or distribution.

Corona effect: Electrical breakdown of air into charged particles. It is caused by the electric field at the surface of conductors.

Council on Environmental Quality (CEQ): Established by the *National Environmental Policy Act* (NEPA), the CEQ consists of three members appointed by the President. A CEQ regulation (Title 40 Code of Federal Regulations [CFR] 1500-1508, as of July 1, 1986) describes the process for implementing NEPA, including preparation of environmental assessments and environmental impacts statements, and the timing and extent of public participation.

Criteria pollutants: An air pollutant that is regulated by the National Ambient Air Quality Standards (NAAQS). The U.S. Environmental Protection Agency (EPA) must describe the characteristics and potential health and welfare effects that form the basis for setting or revising the standard for each regulated pollutant. Criteria pollutants include sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and particulate matter.

Critical habitat: Defined in the Endangered Species Act of 1973 as “specific areas within the geographical area occupied by [an endangered or threatened] species..., essential to the conservation of the species and which may require special management considerations or protection; and specific areas outside the geographical area occupied by the species... that are essential for the conservation of the species.”

Cultural resources: Districts, sites, structures, and objects and evidence of some importance to a culture, a subculture, or a community for scientific, traditional, religious, and other reasons. These resources and relevant environmental data are important for describing and reconstructing past lifeways, for interpreting human behavior, and for predicting future courses of cultural development.

Cumulative impact: The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Customer: Any entity or entities purchasing power from the power generator or distributor provider.

Decibel (dB): A unit for expressing the relative intensity of sounds on a logarithmic scale from zero for the average least perceptible sound to about 130 for the average level at which sound causes pain to humans. For traffic and industrial noise measurements, the A-weighted decibel (dBA), a frequency-weighted noise unit, is widely used. The A-weighted decibel scale corresponds approximately to the frequency response of the human ear and thus correlates well with loudness.

Demand: The rate at which energy is used at a given instant or averaged over a designated period of time.

Demineralization: To remove minerals, as salt, from water.

Deposition: In geology, the laying down of potential rock-forming materials; sedimentation. In atmospheric transport, the settling out on ground and building surfaces of atmospheric aerosols and particles (“dry deposition”) or their removal from the air to the ground by precipitation (“wet deposition” or “rainout”).

Discharge: The volume of water released from a dam or powerhouse at a given time, usually expressed as cubic feet per second.

Distance zones: The relative visibility from travel routes or observation points.

Double-circuit: Two sets of lines (circuits) on a single tower (a single circuit consists of three conductors).

Drainage basin: An aboveground area that supplies the water to a particular stream.

Drawdown: The height difference between the natural water level in a formation and the reduced water level in the formation caused by the withdrawal of groundwater.

Ecology: A branch of science dealing with the interrelationships of living organisms with one another and with their nonliving environment.

Ecosystem: Living organisms and their nonliving (abiotic) environment functioning together as a community.

Effects: As used in NEPA documentation, the terms effects and impacts are synonymous. Effects can be ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial.

Effluent: A waste stream flowing into the atmosphere, surface water, ground water, or soil. Most frequently the term applies to wastes discharged to surface waters.

Elevation: Height in feet above sea level.

Eligibility: The criteria of significance in American history, architecture, archeology, engineering, and culture. The criteria require integrity and association with lives or events, distinctiveness for any of a variety of reasons, or importance because of information the property does or could hold.

Eligible cultural resource: A cultural resource that has been evaluated and reviewed by an agency and the State Historic Preservation Office(r) and recommended as eligible for inclusion in the National Register of Historic Places, based on the criteria of significance.

Emissions: Pollution discharged into the atmosphere from smoke stacks, other vents, and surface areas of commercial or industrial facilities, residential chimneys, and vehicle exhausts.

Emission Standards: Requirements established by a state, local government, or the U.S. Environmental Protection Agency (EPA) Administrator that limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis.

Endangered Species: Plants or animals that are in danger of extinction through all or a significant portion of their ranges and that have been listed as endangered by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service following the procedures outlined in the Endangered Species Act and its implementing regulations (50 CFR 424). *Note: Some states also list species as endangered. Thus, in certain cases a state definition would also be appropriate.*

Endangered Species Act: (16 U.S. Code 1531 et seq.) Provides for listing and protection of animal and plant species identified as in danger, or likely to be in danger, or extinction throughout all or a significant portion of their range. Section 7 places strict requirements on federal agencies to protect listed species.

Environmental Assessment (EA): A document prepared in order to provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement (EIS) or a finding of no significant impact (FONSI). The document includes discussions of the need for the proposed action, alternatives, the environmental setting or affected environment, the environmental impacts of the proposed action and alternatives, and a listing of agencies and persons consulted. This document is prepared in accordance with 40 CFR 1508.9. A Rural Utilities Service EA is prepared in accordance with applicable requirements of the Council on Environmental Quality NEPA regulations in 40 CFR Parts 1500-1508, and the Rural Utilities Service NEPA regulations in 7 CFR 1794.

Environmental Justice: An identification of potential disproportionately high and adverse impacts on low-income and/or minority populations that may result from proposed federal actions (required by Executive Order 12898, see description below).

Energy: That which does or is capable of doing work. It is measured in terms of the work it is capable of doing; electric energy is usually measured in kilowatt-hours.

Ephemeral stream: A stream that flows only after a period of heavy precipitation.

Erosion: Wearing away of soil and rock by weathering and the actions of surface water, wind, and underground water.

Ethnographic: Information about cultural beliefs and practices.

Executive Order 12898: Issued by the President on February 11, 1994, this Executive Order requires federal agencies to develop implementation strategies, identify low-income and minority populations that may be disproportionately impacted by proposed federal actions, and solicit the participation of low-income and minority populations.

Facility: The power generating components of the natural gas-fired, simple cycle peaking power plant.

Fault: A fracture or a zone of fractures within a rock formation along which vertical, horizontal, or transverse slippage has occurred.

Field effect: Induced currents and voltages as well as related effects that might occur as a result of electric and magnetic fields at ground level.

Finding of No Significant Impact (FONSI): Public document prepared by a Federal agency briefly presenting the reasons why a proposed action will not have a significant effect on the human environment and thus indicating that an environmental impact statement will not be prepared. It includes the environmental assessment, or a summary of it, and notes any other

environmental documents related to it. This document is prepared in accordance with 40 CFR 1508.13, and the Rural Utilities Service NEPA regulations in 7 CFR 1794.

Floodplain: The lowlands adjoining inland and coastal waters and relatively flat areas, including at a minimum that area inundated by a 1-percent or greater chance flood in any given year. The base floodplain is defined as the 100-year (1.0 percent) floodplain. The critical action floodplain is defined as the 500-year (0.2 percent) floodplain.

Floodway: The necessary area encompassing main channel and existing outback area to pass a 100-year quantity of flow without impacting the 100-year profile; also known as a swift water area.

Flow: The volume of water passing a given point per unit of time. Same as streamflow.

Formation: In geology, the primary unit of formal stratigraphic mapping or description. Most formations possess certain distinctive features.

Gauss: Unit of measurement of magnetic field.

Generating unit: The combination of generator and step-up transformer.

Generation: The act or process of producing electricity from other forms of energy.

Generator: A machine that converts mechanical energy into electrical energy.

Groundwater: Water within the earth that supplies wells and springs.

Hazardous Air Pollutants: Air pollutants that are not covered by ambient air quality standards, but that may present a threat of adverse human health effects or adverse environmental effects.

Hazardous waste: A category of waste regulated under the Resource Conservation and Recovery Act (RCRA). To be considered hazardous, a waste must be a solid waste under RCRA and must exhibit at least one of four characteristics described in 40 CFR 261.20 through 40 CFR 261.24 (i.e., ignitability, corrosivity, reactivity, or toxicity) or be specifically listed by the Environmental Protection Agency in 40 CFR 261.31 through 40 CFR 261.33.

Historic properties: Under the *National Historic Preservation Act*, these are properties of national, state, or local significance in American history, architecture, archaeology, engineering, or culture, and worthy of preservation.

Hydraulic conductivity: A coefficient describing the rate at which water can move through a permeable medium.

Impacts (effects): As assessment of the meaning of changes in all attributes being studied for a given resource; an aggregation of all the adverse effects, usually measured using a qualitative and nominally subjective technique. In this EA, as well as in the CEQ regulations, the word impact is used synonymously with the word effect.

Indirect impacts: Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-

inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

Infrastructure: The basic installations and facilities on which the continuance and growth of a community or state (e.g., roads, schools, power plants, transportation, communication systems) are based.

Intensity (of an earthquake): A measure of the effects (due to ground shaking) of an earthquake at a particular location, based on observed damage to structures built by humans, changes in the earth's surface, and reports of how people felt the earthquake. Earthquake intensity is measured in numerical units on the Modified Mercalli scale. [See Modified Mercalli Intensity scale and magnitude (of an earthquake).]

Intertie: A transmission line that links two or more regional electric power systems.

Interested parties: Those groups or individuals that are interested, for whatever reason, in the project and its progress. Interested parties include but are not limited to private individuals, public agencies, organizations, customers, and potential customers.

Invertebrate: Animals characterized by not having a backbone or spinal column, including a wide variety of organisms such as insects, spiders, worms, clams, crayfish, etc.

Isolated occurrence: A grouping of less than ten artifacts or a single undatable feature. These often consists of redeposited material of questionable locational context that are not related to nearby archaeological sites.

Kilovolt (kV): The electrical unit of power that equals 1,000 volts.

Lacustrine deposits: Deposits found or formed in lakes.

Level of service: In transportation analysis, a qualitative measure describing operational conditions within a traffic stream and how they are perceived by motorists and/or passengers.

Lithic: A stone artifact that has been modified or altered by human hands.

Load: The amount of electric power required at a given point on a system.

Low-income population: A population that is classified by the U.S. Bureau of the Census as having an aggregated mean income level for a family of four that correlates to \$13,359, adjusted through the poverty index using a standard of living percentage change where applicable, and whose composition is at least 25 percent of the total population of a defined area or jurisdiction.

Loam: A rich, permeable soil composed of a mixture of clay, silt, sand, and organic matter.

Magnitude (of an earthquake): A quantity characteristic of the total energy released by an earthquake, as contrasted to "intensity," which describes its effects at a particular place. Magnitude is calculated using common logarithms (base 10) of the largest ground motion. A one-unit increase in magnitude (for example, from magnitude 6 to magnitude 7) represents a 30-

fold increase in the amount of energy released. Three common types of magnitude are Richter (or local) (M_L), P body wave (m_b), and surface wave (M_s).

Major source: Any stationary source or group of stationary sources in which all of the pollutant-emitting activities at such source emit, or have the potential to emit, 100 or more tons per year of any regulated air pollutants.

Mammal: Animals in the class Mammalia that are distinguished by having self regulating body temperature, hair, and in females, milk-producing mammary glands to feed their young.

Megawatt (MW): The electrical unit of power that equals 1 million watts or 1 thousand kilowatts.

Merchant plant: A power plant not owned by a utility.

Meteorology: The science dealing with the dynamics of the atmosphere and its phenomena, especially relating to weather.

Mineral: Naturally occurring inorganic element or compound.

Minority Population: A population that is classified by the U.S. Bureau of the Census as African American, Hispanic American, Asian and Pacific American, American Indian, Eskimo, Aleut, and other non-White persons, whose composition is at least 25 percent of the total population of a defined area or jurisdiction.

Mitigation: The alleviation of adverse impacts on environmental resources by avoidance through project redesign or project relocation, by protection, or by adequate scientific study.

Modified Mercalli Intensity Scale: The Modified Mercalli Intensity Scale is a standard of relative measurement of earthquake intensity, developed to fit construction conditions in most of the United States. It is a 12-step scale, with values from I (not felt except by a very few people) to XII (damage total).

National Ambient Air Quality Standards (NAAQS): Standards defining the highest allowable levels of certain pollutants in the ambient air. Because the U.S. Environmental Protection Agency (EPA) must establish the criteria for setting these standards, the regulated pollutants are called criteria pollutants.

National Emissions Standards for Hazardous Air Pollutants (NESHAPs): Emissions standards set by the Environmental Protection Agency for air pollutants which are not covered by National Ambient Air Quality Standards (NAAQS) and which may, at sufficiently high levels, cause increased fatalities, irreversible health effects, or incapacitating illness.

National Environmental Policy Act: 42 U.S.C. 4341, passed by Congress in 1975. The Act established a national policy designed to encourage consideration of the influences of human activities (e.g., population growth, high-density urbanization, industrial development) on the natural environment. NEPA also established the Council on Environmental Quality (CEQ). NEPA procedures require that environmental information be made available to the public before

decision are made. Information contained in NEPA documents must focus on the relevant issues in order to facilitate the decision-making process.

National Historic Preservation Act (NHPA): (16 U.S.C. 470) Provides for an expanded National Register of Historic Places (NRHP) to register districts, sites, buildings, structures, and objects significant to American history, architecture, archaeology, and culture. Section 106 requires that the President's Advisory Council on Historic Preservation be afforded an opportunity to comment on any undertaking that adversely affects properties listed in the NRHP.

National Pollutant Discharge Elimination System (NPDES) Permit: Federal regulation (40 CFR Parts 122 and 125) that requires permits for the discharge of pollutants from any point source into the waters of the U.S. regulated through the *Clean Water Act*, as amended.

National Register of Historic Places: A list maintained by the Secretary of the Interior of districts, sites, buildings, structures, and objects of prehistoric or historic local, state, or National significance. The list is expanded as authorized by Section 2(b) of the *Historic Sites Act of 1935* (16 U.S.C. 462) and Section 101(a)(1)(A) of the *National Historic Preservation Act of 1966*, as amended.

Native vegetation: Plant life that occurs naturally in an area without agricultural or cultivation efforts. It does not include species that have been introduced from other geographical areas and have become naturalized.

Noise: Unwanted or undesirable sound, usually characterized as being so loud as to interfere with, or be inappropriate to, normal activities such as communication, sleep, study or recreation. (See background noise.)

Nonattainment: An area shown by monitored data or modeling to exceed National Ambient Air Quality Standards for a particular air pollutant.

Nonattainment area: An area that the U.S. Environmental Protection Agency (EPA) has designated as not meeting (that is, not being in attainment of) one or more of the National Ambient Air Quality Standards (NAAQS) for criteria pollutants. An area may be in attainment for some pollutants, but not others.

Ozone: The triatomic form of oxygen. In the stratosphere, ozone protects the earth from the sun's ultraviolet rays but in the lower levels of the atmosphere, ozone is considered an air pollutant.

Paleontology: The study of fossils.

Particulate Matter: Any finely divided solid or liquid material, other than uncombined water.

Peak capacity: The maximum capacity of a system to meet loads.

Peak demand: The highest demand for power during a stated period of time.

Peaking power/peaking generation: Power plant capacity that is typically used to meet rapid increases or the highest levels of demand in a utility's load or demand profile. Peaking generation is usually oil, gas-fired, or hydropower generation.

Permeability: The ability of rock or soil to transmit a fluid.

pH: A measure of the relative acidity or alkalinity of a solution, expressed on scale from 0 to 14, with the neutral point at 7.0. Acid solutions have pH values lower than 7.0, and basic (i.e., alkaline) solutions have pH values higher than 7.0. Because pH is the negative logarithm of the hydrogen ion (H^+) concentration, each unit increase in pH value expresses a change of state of 10 times the preceding state. Thus, pH 5 is 10 times more acidic than pH 6, and pH 9 is 10 times more alkaline than pH 8.

Physiography: The science of the surface of the earth and the interrelations of air, water, and land.

Plume: Visible or measurable discharges of a contaminant from a given point or area of origin into environmental media.

Potable: Suitable for drinking.

Prehistoric: Of, relating to, or existing in times antedating written history. Prehistoric cultural resources are those that antedate written records of the human cultures that produced them.

Present value: The worth of future returns or costs in terms of their current value. To obtain a present value, an interest rate is used to discount these future returns and costs.

Prevention of Significant Deterioration (of air quality) (PSD): Regulations established to prevent significant deterioration of air quality in areas that already meet National Ambient Air Quality Standards (NAAQS). Among other provisions, cumulative increases in sulfur dioxide, nitrogen dioxide, and PM-10 levels after specified baseline dates must not exceed specified maximum allowable amounts.

Prime farmland: Soil types with a combination of characteristics that make the soils particularly productive for agriculture.

Production Costs: The cost of producing electricity.

Project: Involves the construction and operation of two circulating fluidized bed power generation units and construction of a new 345-kV transmission line.

Quaternary: The second period of the Cenozoic era, following the Tertiary; also, the corresponding system of rocks. It consists of two epochs, the Pleistocene and the Holocene.

Raptor: Birds of prey including various types of hawks, falcons, eagles, vultures, and owls.

Reliability: The ability of the power system to provide customers uninterrupted electric service. Includes generation, transmission, and distribution reliability.

Region of Influence (ROI): The geographical region that would be expected to be affected in some way by proposed action and alternative.

Right-of-way: An easement for a certain purpose over the land of another, such as a strip of land used for a transmission line, roadway or pipeline.

Riparian: Of or pertaining to the bank of a river, stream, lake, or other water bodies.

Runoff: The portion of rainfall, melted snow, or irrigation water that flows across the ground surface and may eventually enter streams.

Saturated zone: The zone in which the voids in the rock or soil are filled with water at a pressure greater than atmospheric pressure. The water table is the top of the saturated zone in an unconfined aquifer.

Scoping: An early, open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action.

Section 106 process: A National Historic Preservation Act (16 U.S.C. §470 et seq.) review process used to identify, evaluate, and protect cultural resources eligible for nomination to the National Register of Historic Places that may be affected by federal actions or undertakings.

Sediment: Material deposited by wind or water.

Sedimentation: The process of deposition of sediment, especially by mechanical means from a state of suspension in water.

Seismic: Pertaining to any earth vibration, especially an earthquake.

Sensitive species: Those plants and animals identified by the Regional Forester for which population viability is a concern, as evidenced by significant current or predicted downward trend in populations or density and significant or predicted downward trend in habitat capability.

Socioeconomics: The social and economic condition in the study area.

Solid waste: In general, solid wastes are non-liquid, non-soluble discarded materials ranging from municipal garbage to industrial wastes that contain complex and sometimes hazardous substances. Solid wastes include sewage sludge, agricultural refuse, demolition wastes, and mining residues.

Stability class: A category characterizing the degree of stability, or absence of turbulence, in the atmosphere.

State Historic Preservation Officer (SHPO): The official within each state, authorized by the state at the request of the Secretary of the Interior, to act as liaison for purposes of implementing the *National Historic Preservation Act*.

Step-up transformer: Transformer in which the energy transfer is from a low- to a high-voltage winding or windings. (Winding means one or more turns of wire forming a continuous coil for a transformer, relay, rotating machine, or other electric device.)

Stratigraphic: Of, relating to, or determined by stratigraphy; the superposition of layers (soil, rock, and other materials) often observed at archaeological sites.

Substation: Facility with transformers where voltage on transmission lines change from one level to another.

Surface water: All bodies of water on the surface of the earth and open to the atmosphere, such as rivers, lakes, reservoirs, ponds, seas, and estuaries.

Switchyard: Facility with circuit breakers and automatic switches to turn power on and off on different transmission lines.

Threatened species: Plant and wildlife species likely to become endangered in the foreseeable future.

Threatened or Endangered species: Animals, birds, fish, plants, or other living organisms threatened with extinction by man-made or natural changes in their environment. Requirements for declaring species endangered are contained in the *Endangered Species Act of 1973*.

Traditional Cultural Property/Use Area: Areas of significance to the beliefs, customs, and practices of a community of people that have been passed down through generations.

Transformer: A device for transferring energy from one circuit to another in an alternating-current system. Its most frequent use in power systems is for changing voltage levels.

Transmission line: The structures, insulators, conductors and other equipment used to transfer electrical power from one point to another.

Transmission services: These services may include firm and nonfirm transmission, as well as transmission by a third party. Firm and nonfirm transmission services occur when capacity and energy are received into a system at points of interconnection with other systems and transmitted and delivered to points of delivery from a system.

U.S. Environmental Protection Agency (EPA): The independent federal agency, established in 1970, that regulates federal environmental matters and oversees the implementation of federal environmental laws.

Vertebrate: Animals that are members of the subphylum Vertebrata, including the fishes, amphibians, reptiles, birds, and mammals, all of which are characterized by having a segmented bony or cartilaginous spinal column.

Volatile Organic Compounds: A broad range of organic compounds, often halogenated, that vaporize at typically background or relatively low temperatures.

Volt: The unit of voltage or potential difference. It is the electromotive force which, if steadily applied to a circuit having a resistance of one ohm, will produce a current of one ampere.

Voltage: Potential for an electric charge to do work; source of an electric field.

Wetland: Land or areas exhibiting hydric soil concentrations, saturated or inundated soil during some portion of the year, and plant species tolerant of such conditions.

Wind rose: A circular diagram showing, for a specific location, the percentage of the time the wind is from each compass direction. A wind rose for use in assessing consequences of airborne releases also shows the frequency of different wind speeds for each compass direction.

13.0 LIST OF PREPARERS

Name	Education/Years of Experience	Responsibility on this EA
Andrew Brooks	MA, Environmental Policy BA, History Years of Experience: 2	Socioeconomics; Environmental Justice; Transportation
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Introduction; Proposed Action
and Alternatives; Ecological
Resources; Unavoidable,
Adverse Environmental
Impacts; Irreversible and
Irretrievable Commitments of
Resources; Relationship
Between Short-Term Use of
the Environment and the
Maintenance and
Enhancement of Long-Term
Productivity

APPDENDIX A

PHOTO LOG

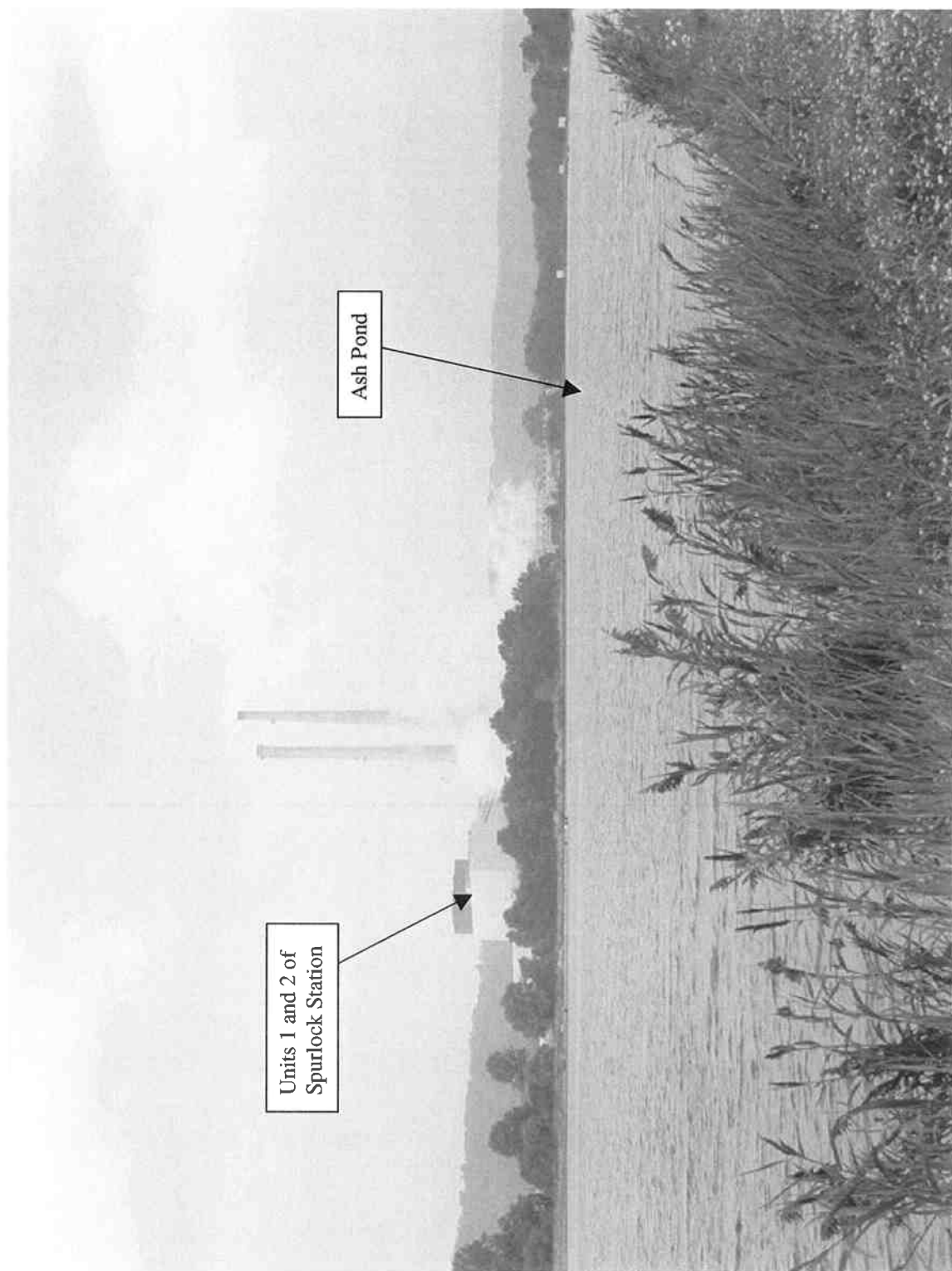


PHOTO 1: Facing South. Ash Pond in Foreground, Spurlock Station in Background.



PHOTO 2: Facing West. Inland Paperboard and Packaging in the Foreground, Spurlock Station in the Background.

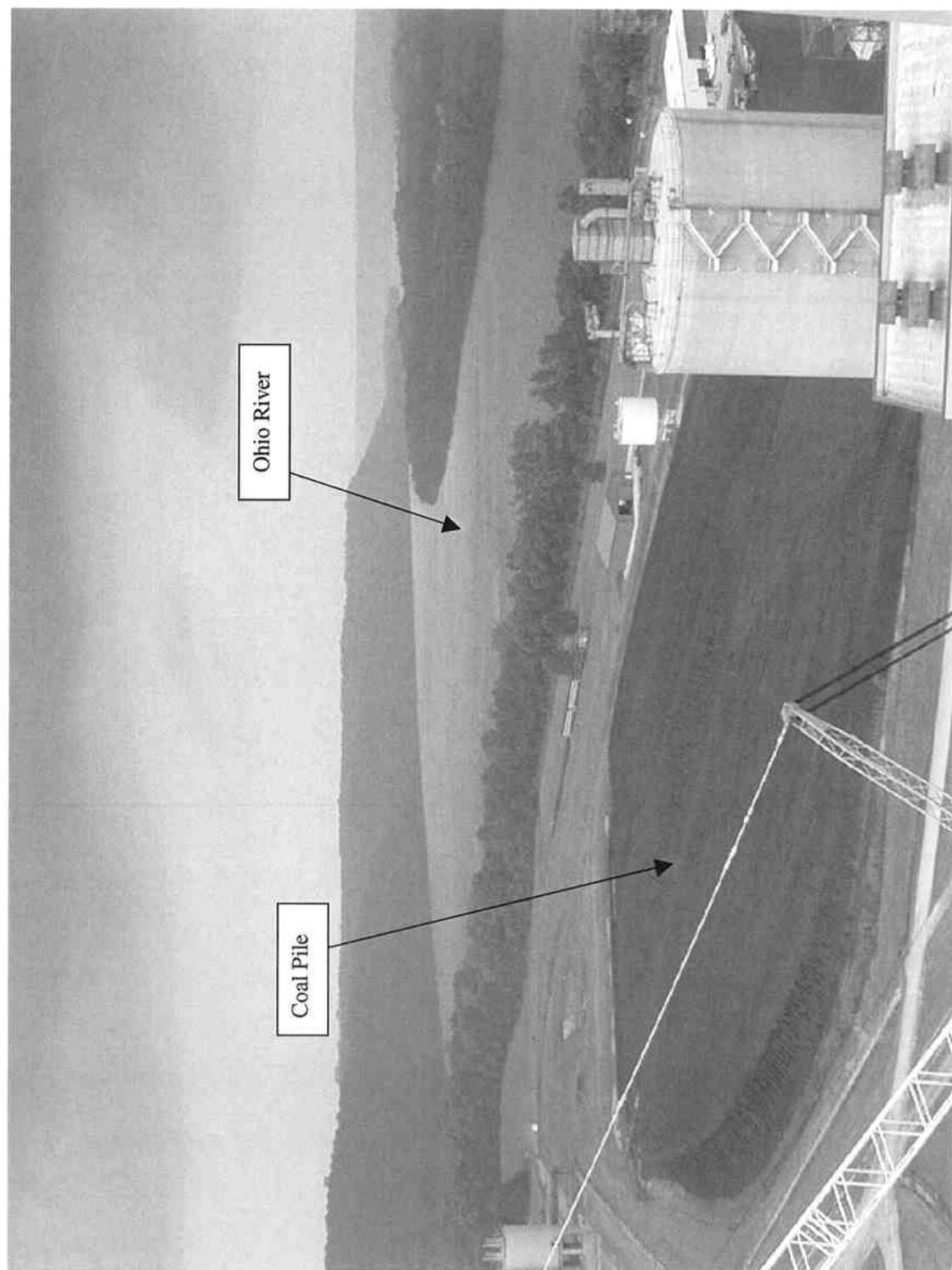


PHOTO 3: Facing West. From Top of Building Housing Units 1 and 2: Coal Pile in Foreground; Ohio River in Background.

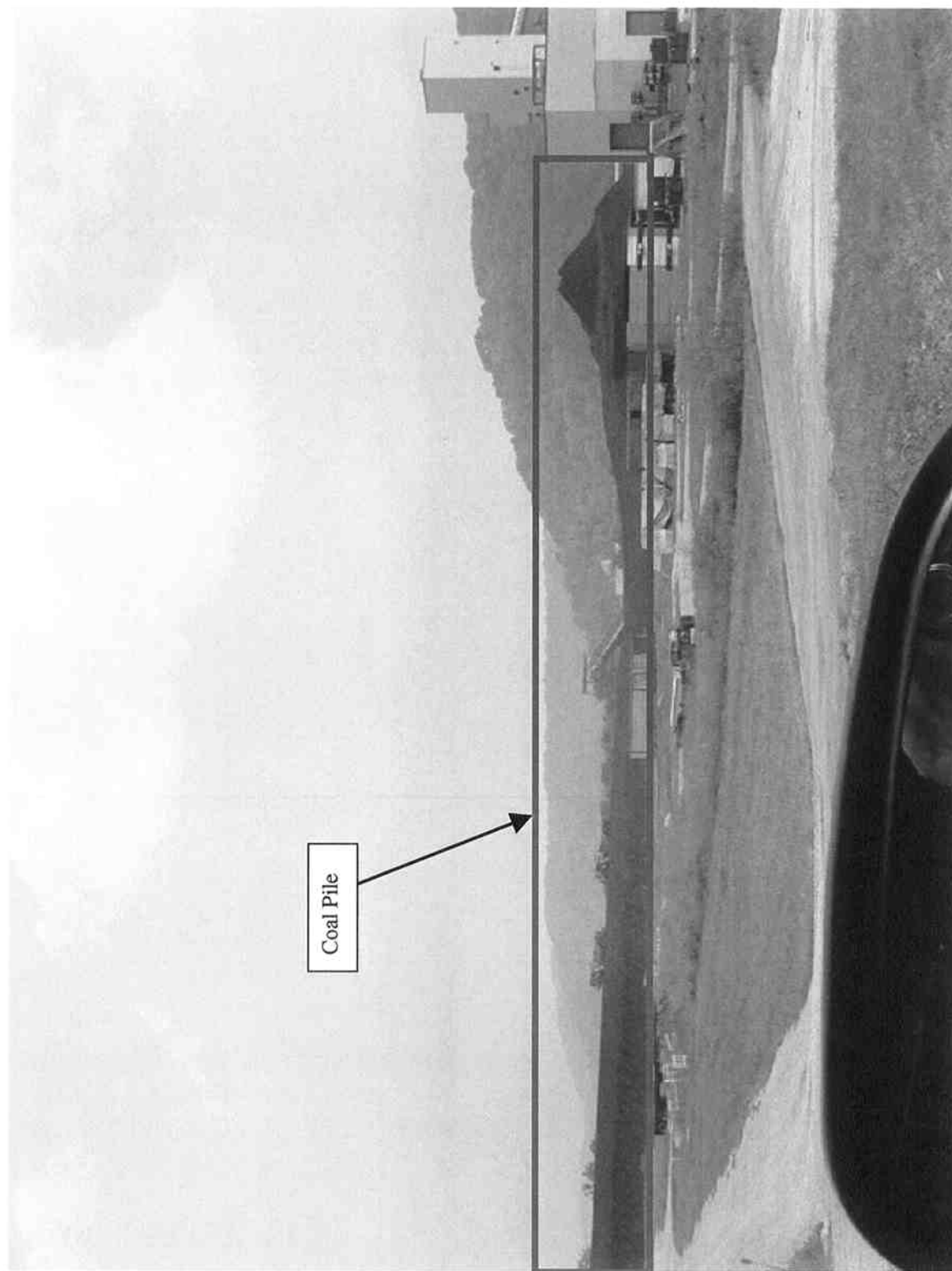


PHOTO 4: Existing Coal Pile.



PHOTO 5: Coal Conveyor System.

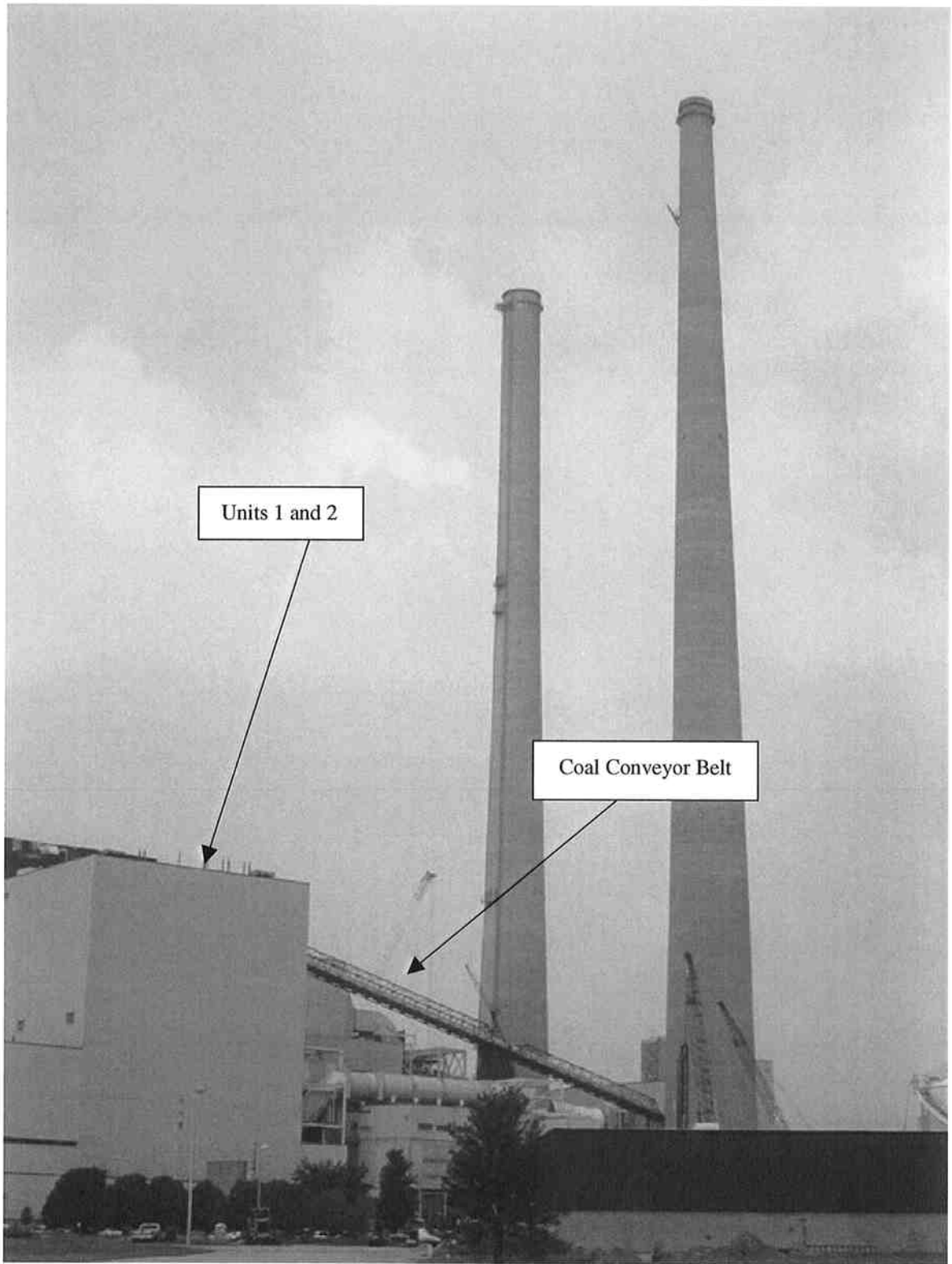


PHOTO 6: Eight hundred and five [805]-Foot (46-meter) Stacks for Units 1 and 2 with coal conveyor belt.



PHOTO 7: Three hundred and fifty thousand [350,000]-gallon (1,324,890-liter) Above Ground Storage Tanks with No. 2 Fuel Oil.



PHOTO 8: Cooling Towers for Units 1 and 2.

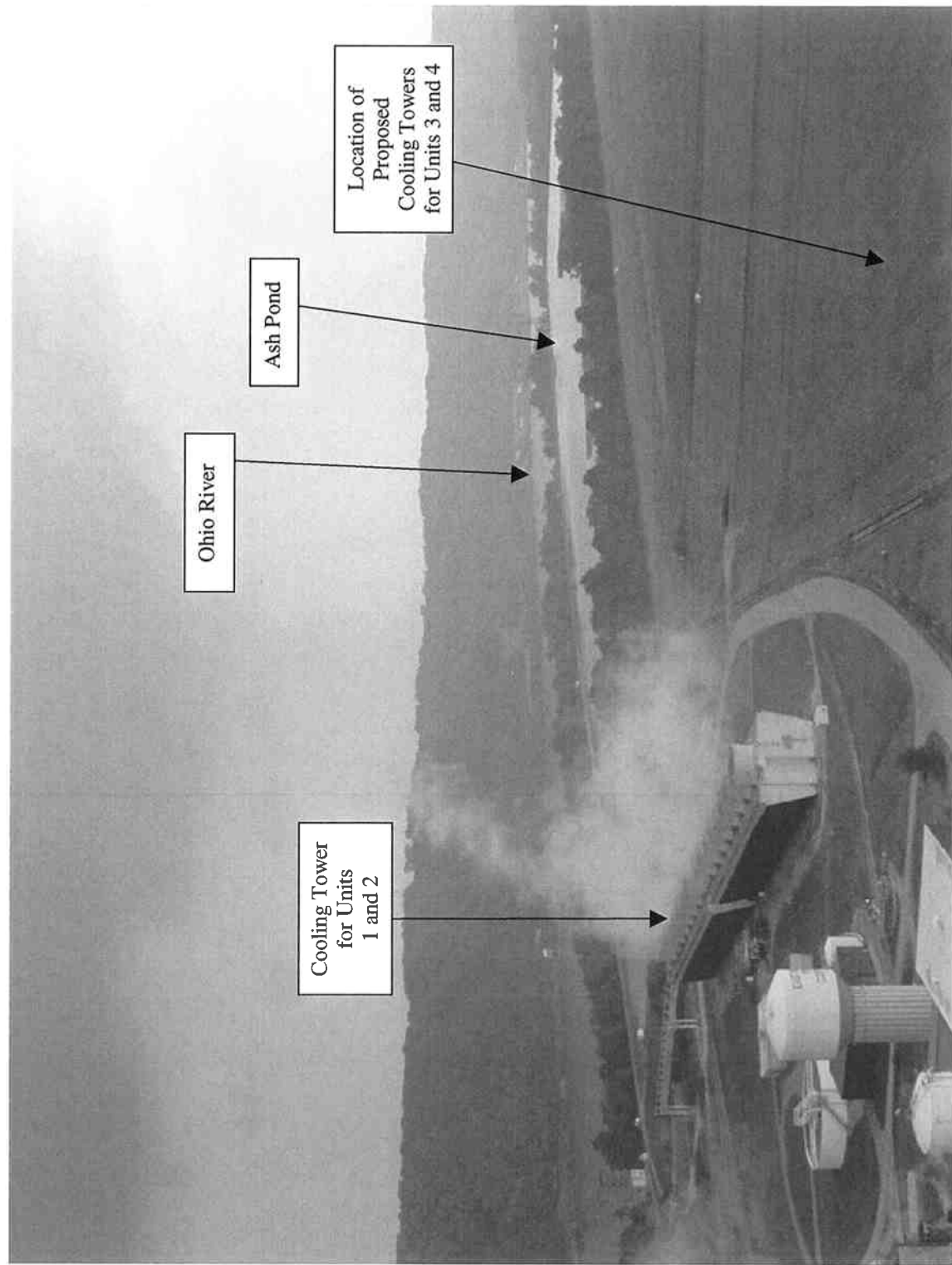


PHOTO 9: Facing Northeast. From Top of Building Units 1 and 2: Cooling Towers for Units 1 and 2 on Left; Proposed Site for Cooling Towers for Units 3 and 4 on Right.

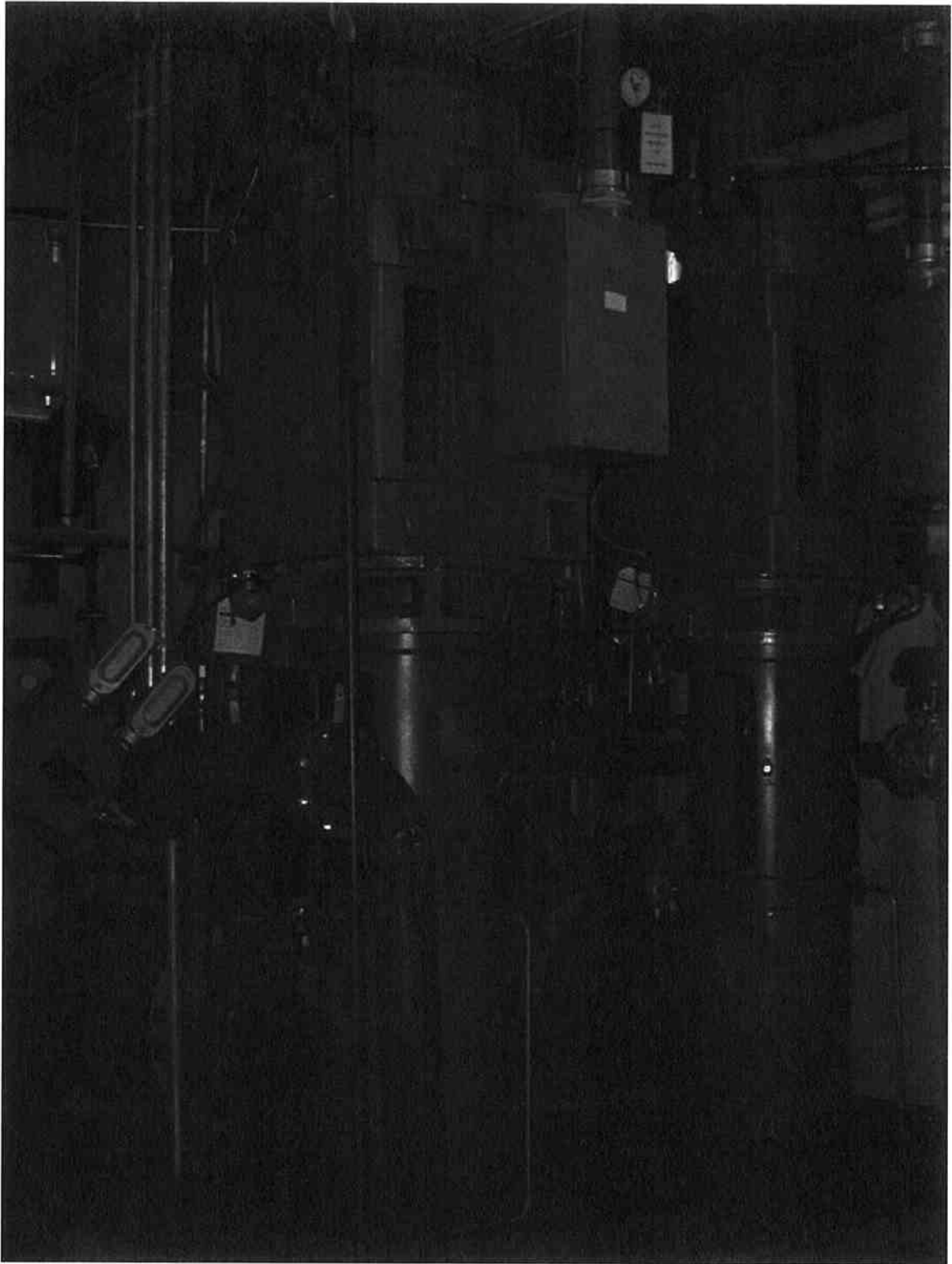


PHOTO 10: Existing Intake Pumps on the Ohio River.

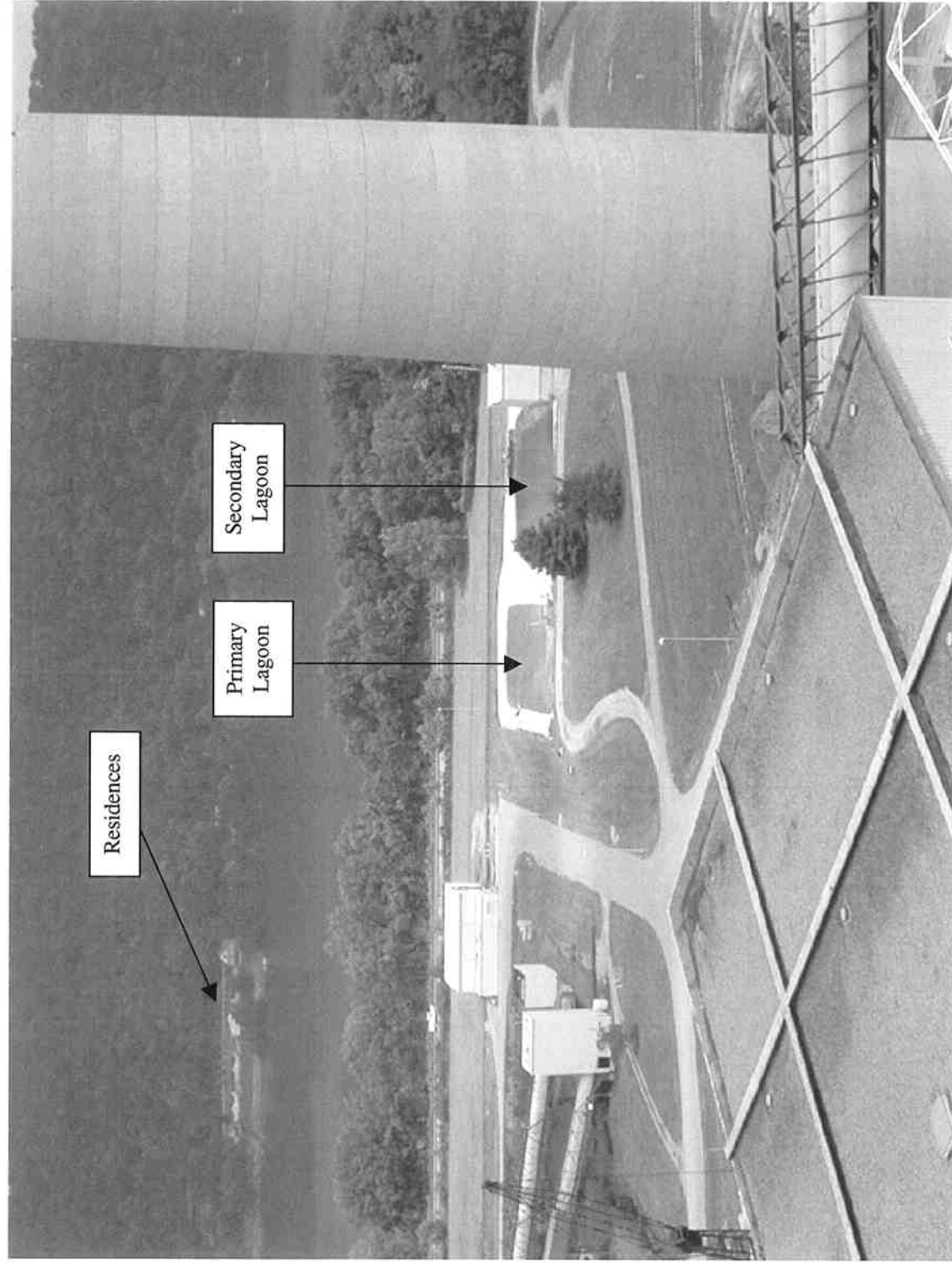


PHOTO 11: From Top of Building housing Units 1 and 2: Facing Northeast. Primary and Secondary Lagoons in Foreground; Residences Across Ohio River in Background.

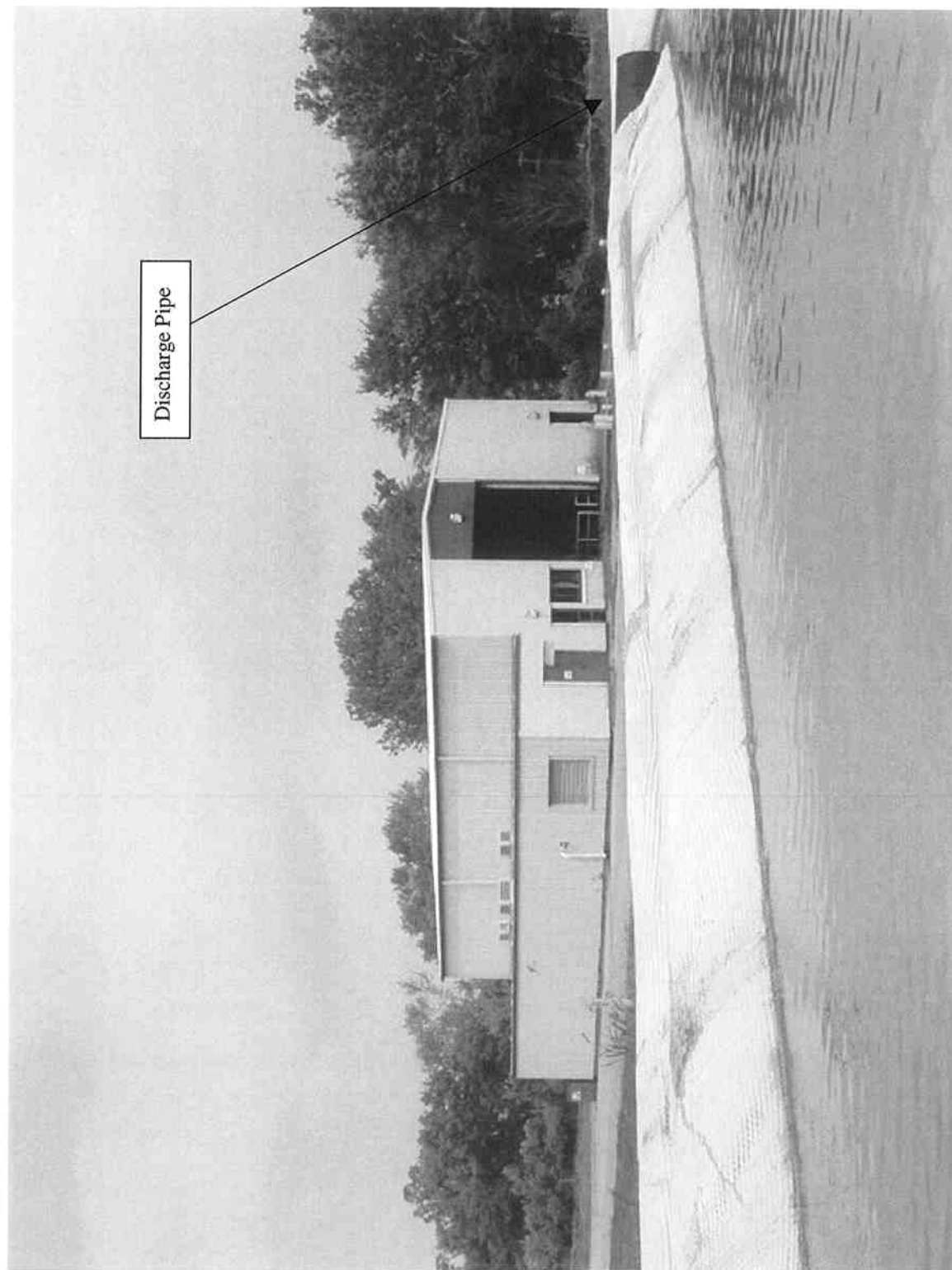


PHOTO 12: Primary Lagoon with Discharge Pipe on Right.



PHOTO 13: Primary Lagoon with Monitoring Equipment on Right.



PHOTO 14: Secondary Lagoon with Discharge/Monitoring Facilities in Background.

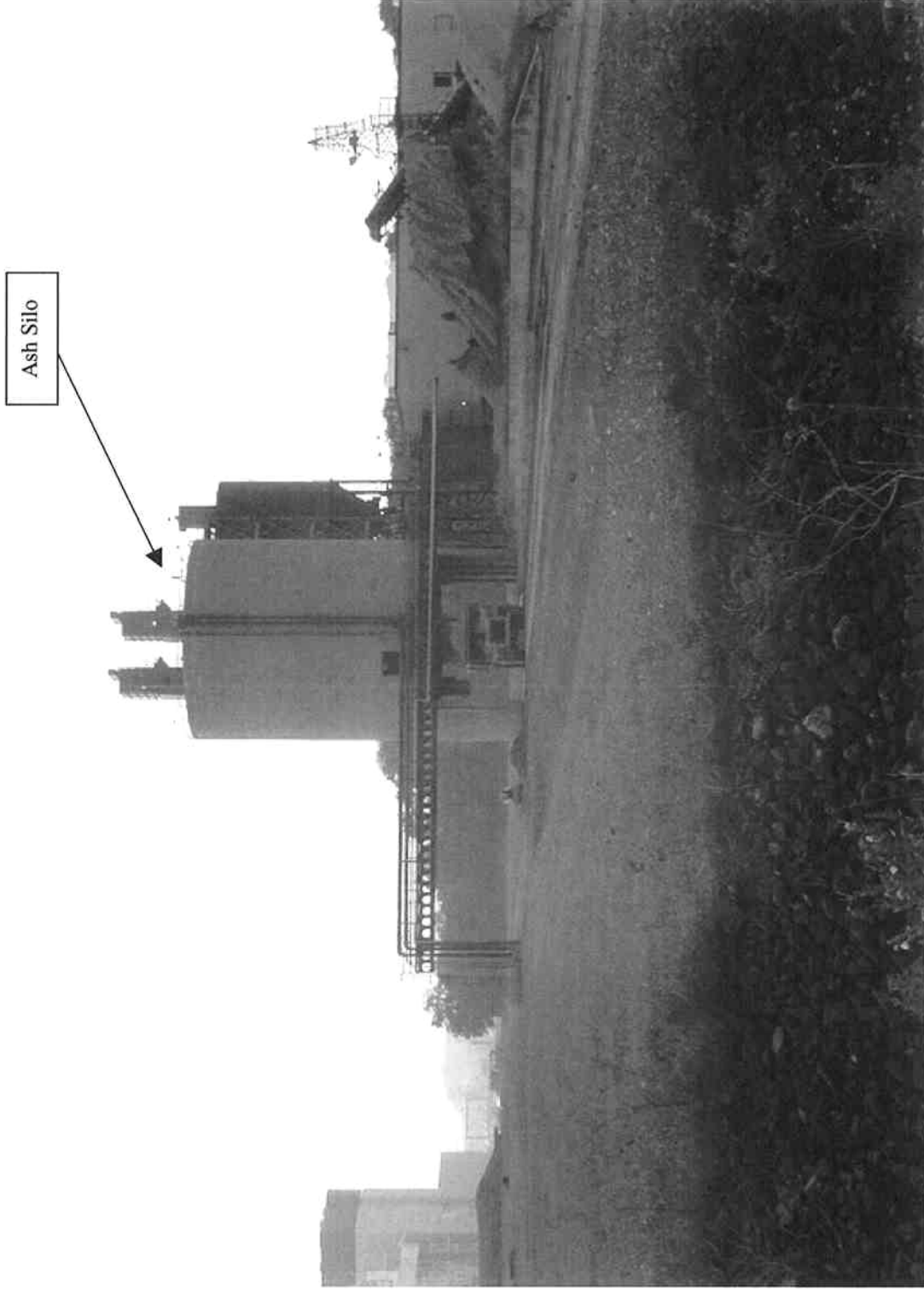


PHOTO 15: Ash Silo Discharging Ash to Truck Underneath.

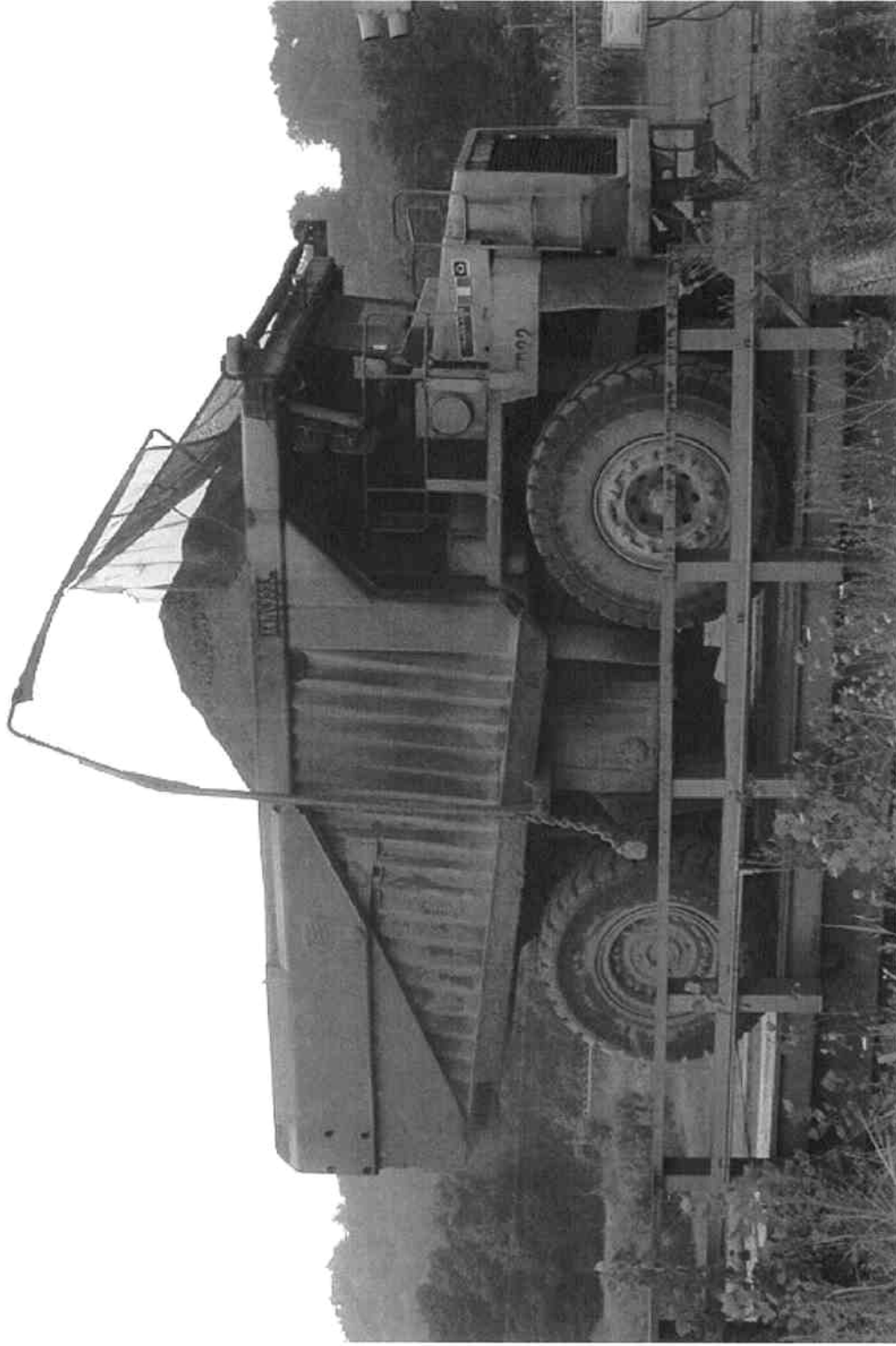


PHOTO 16: Ash Truck with Netting to Contain Fugitive Ash Emissions During Transport to Ash Landfill.

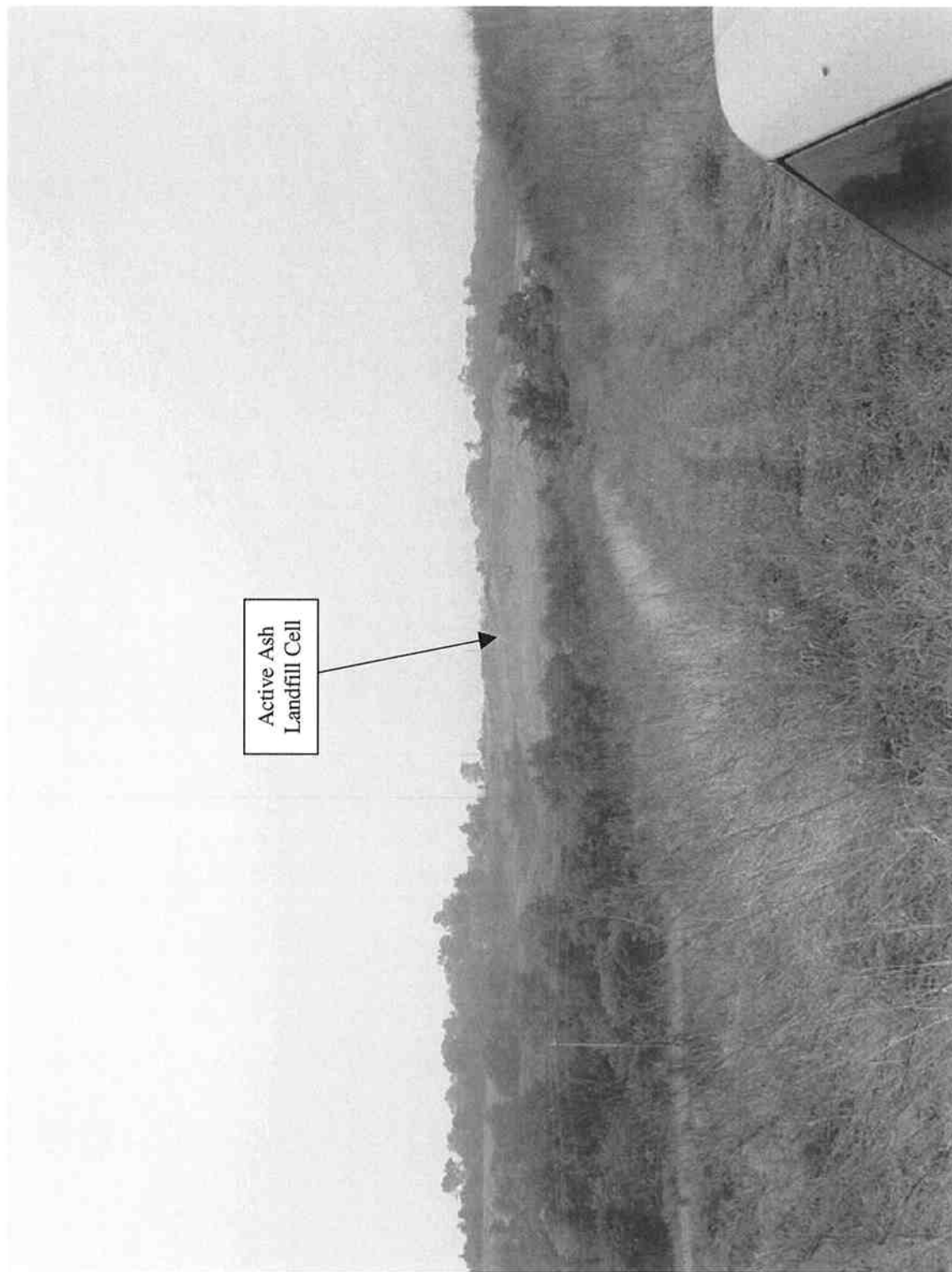


PHOTO 17: Facing South. Active Ash Landfill Cell.



PHOTO 18: Facing South. Sedimentation Pond Catching Stormwater Runoff from Ash Landfill.

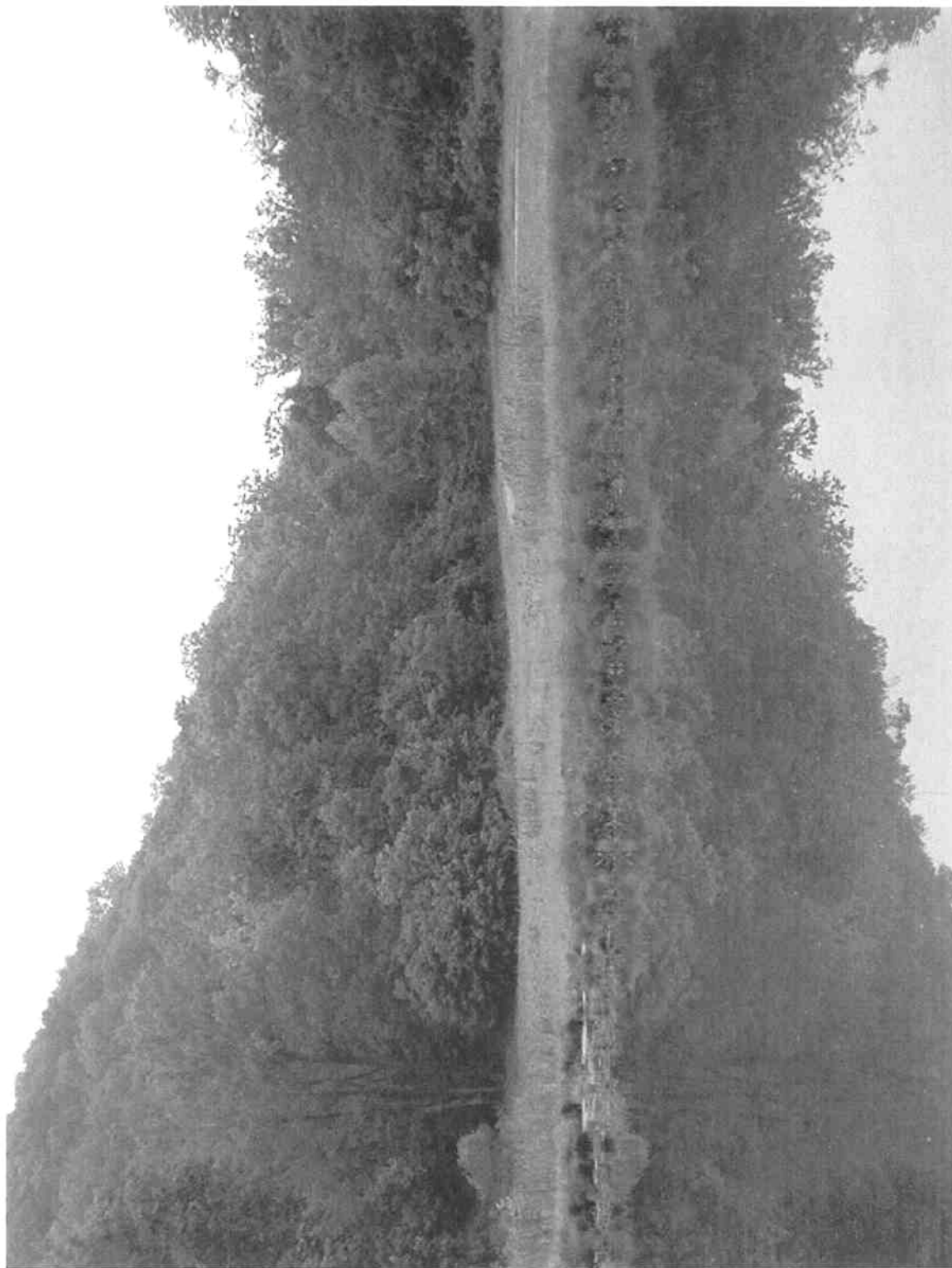


PHOTO 19: Man-Made Wetland Filtering Water from Ash Landfill Sedimentation Ponds.



PHOTO 20: Unfinished Site of Equipment Unloading Area from Barge Transportation.



PHOTO 21: Construction Trailer Area for Proposed Units 3 and 4.



PHOTO 22: Site for Proposed Units 3 and 4 in Immediate Foreground with Building Housing Units 1 and 2 Background.



PHOTO 23: From top of Building Housing Units 1 and 2: Looking Southeast at Substation and Transmission Lines.



PHOTO 24: From Top of Building Housing Units 1 and 2: Facing Southeast. Substation in Foreground and Transmission Line Structures on Top of Ridge.

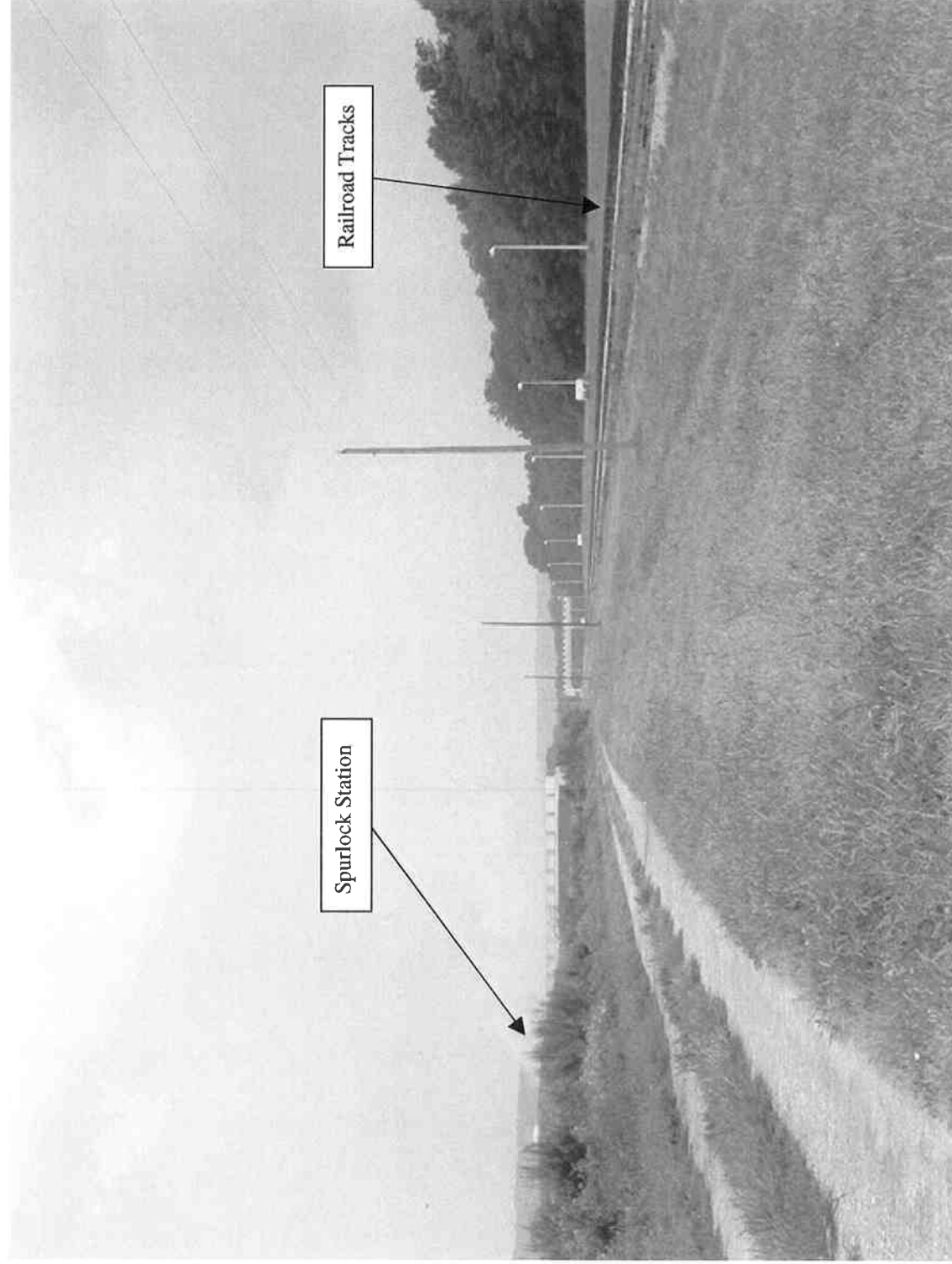


PHOTO 25: Looking West Down Proposed Right-of-Way at Spurlock Station: Proposed 345-kV Transmission Line would Exit the Station and Parallel the Railroad Tracks.

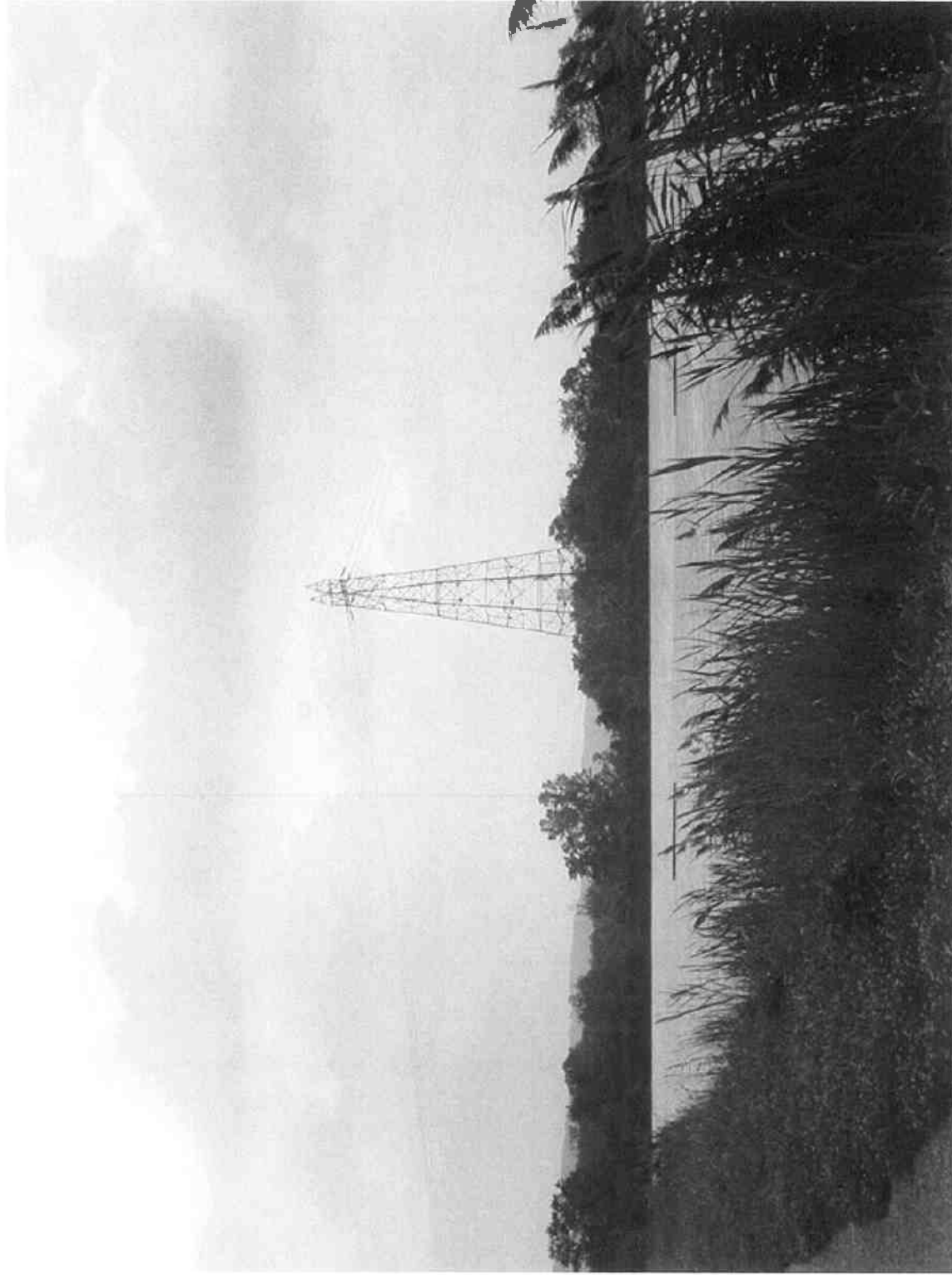


PHOTO 26: Facing East. Existing Kentucky Utilities 138-kV Transmission Line Structure with Ash Pond in Foreground.



PHOTO 27: Looking North Across Ohio River to the Existing Kentucky Utilities 138-kV Transmission Line that the Proposed 345-kV Transmission Line would Parallel.



PHOTO 28: From Ohio Side: Looking South at Existing Kentucky Utilities 138-kV Transmission Line Crossing the Ohio River.

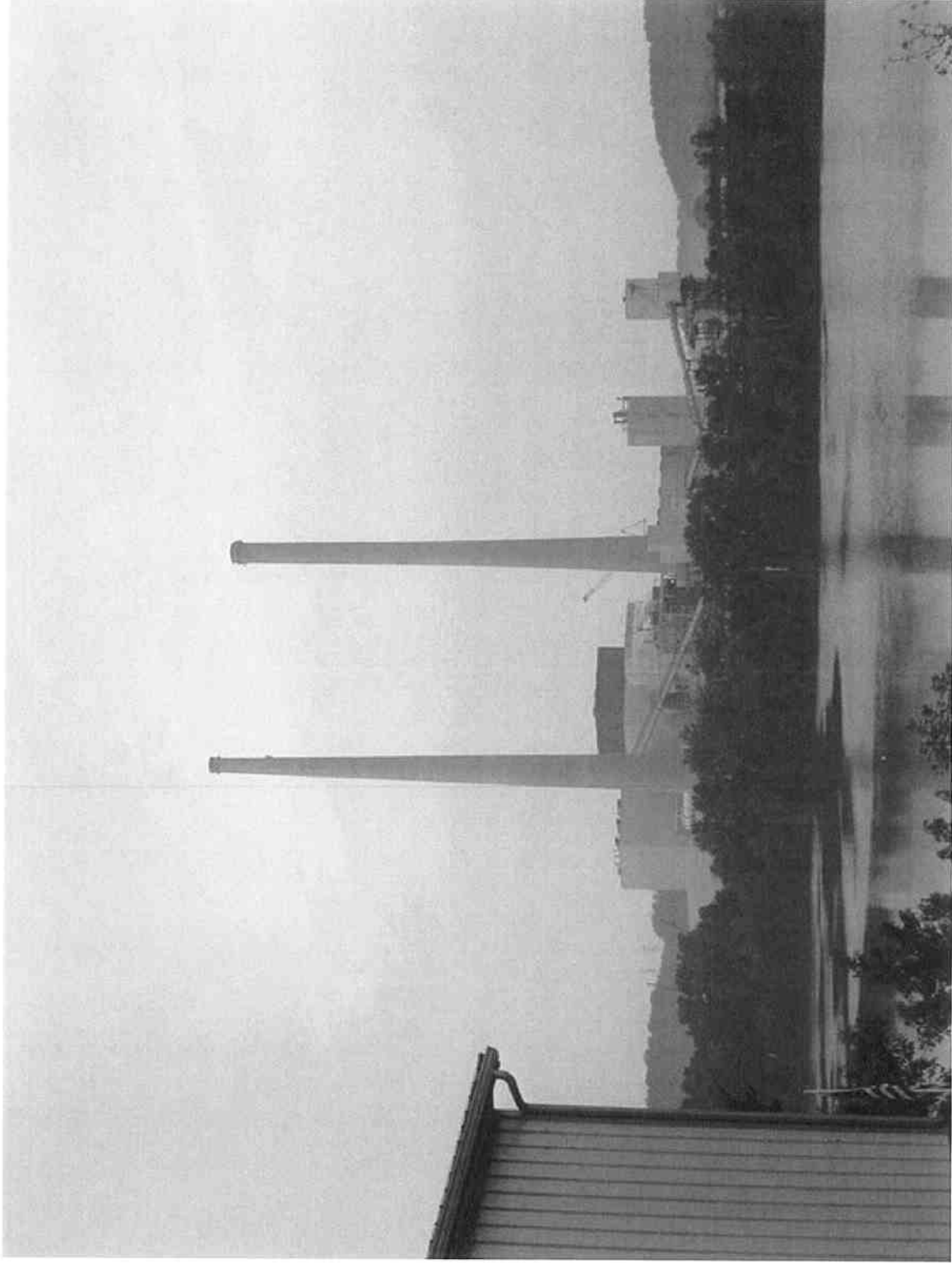


PHOTO 29: From Ohio Side: Looking South at Spurlock Station from a Residence (Lower Left Corner).



PHOTO 30: From Ohio Side: Looking South at the Spurlock Station Barge Dock from a Residence (Right Corner).

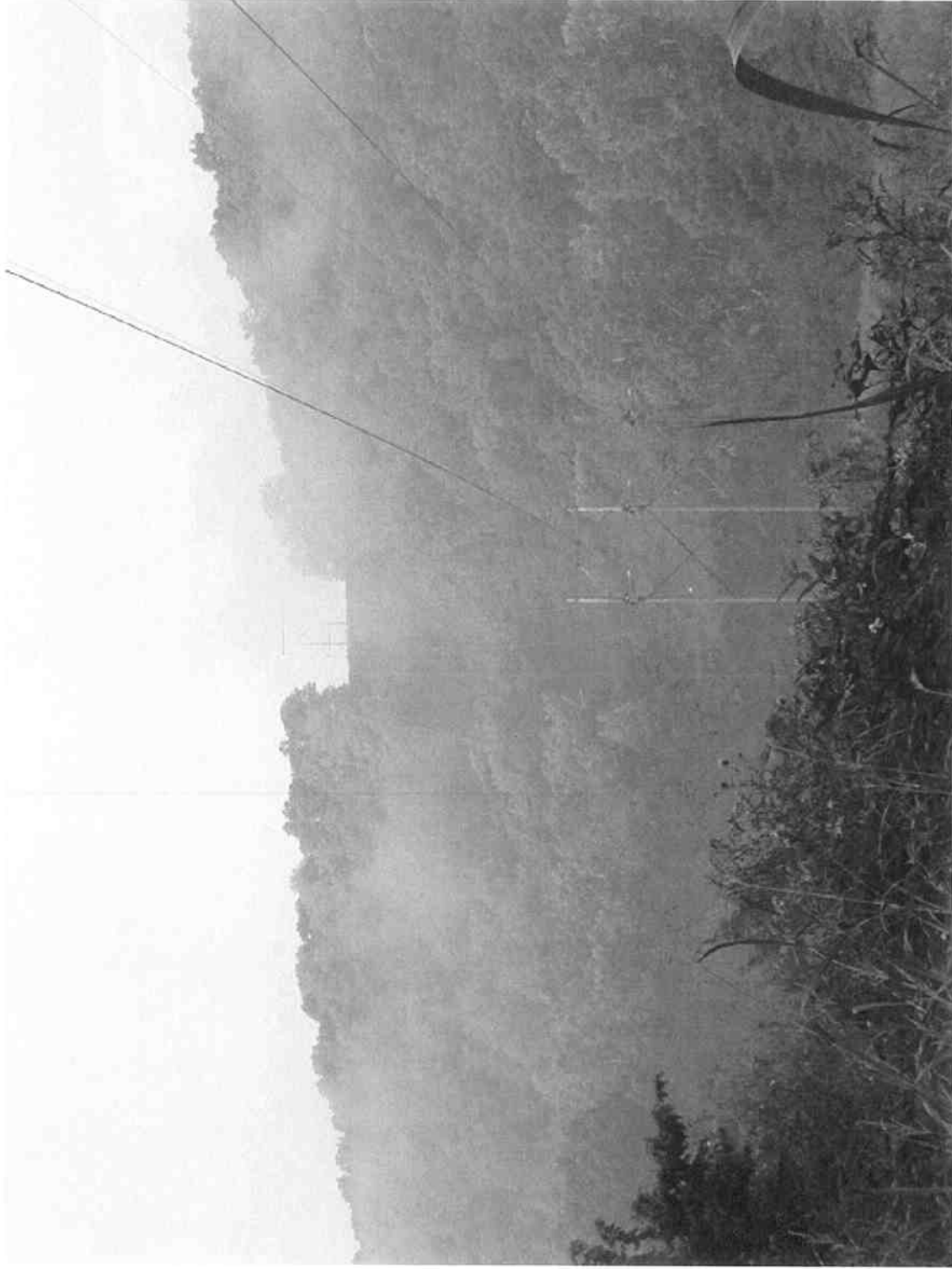


PHOTO 31: On Ohio Side Adjacent to Ohio River. Looking South at Existing Kentucky Utilities 138-kV Transmission Line and 150-foot (46-meter) Right-of-Way that the Proposed 345-kV Transmission Line would Parallel.

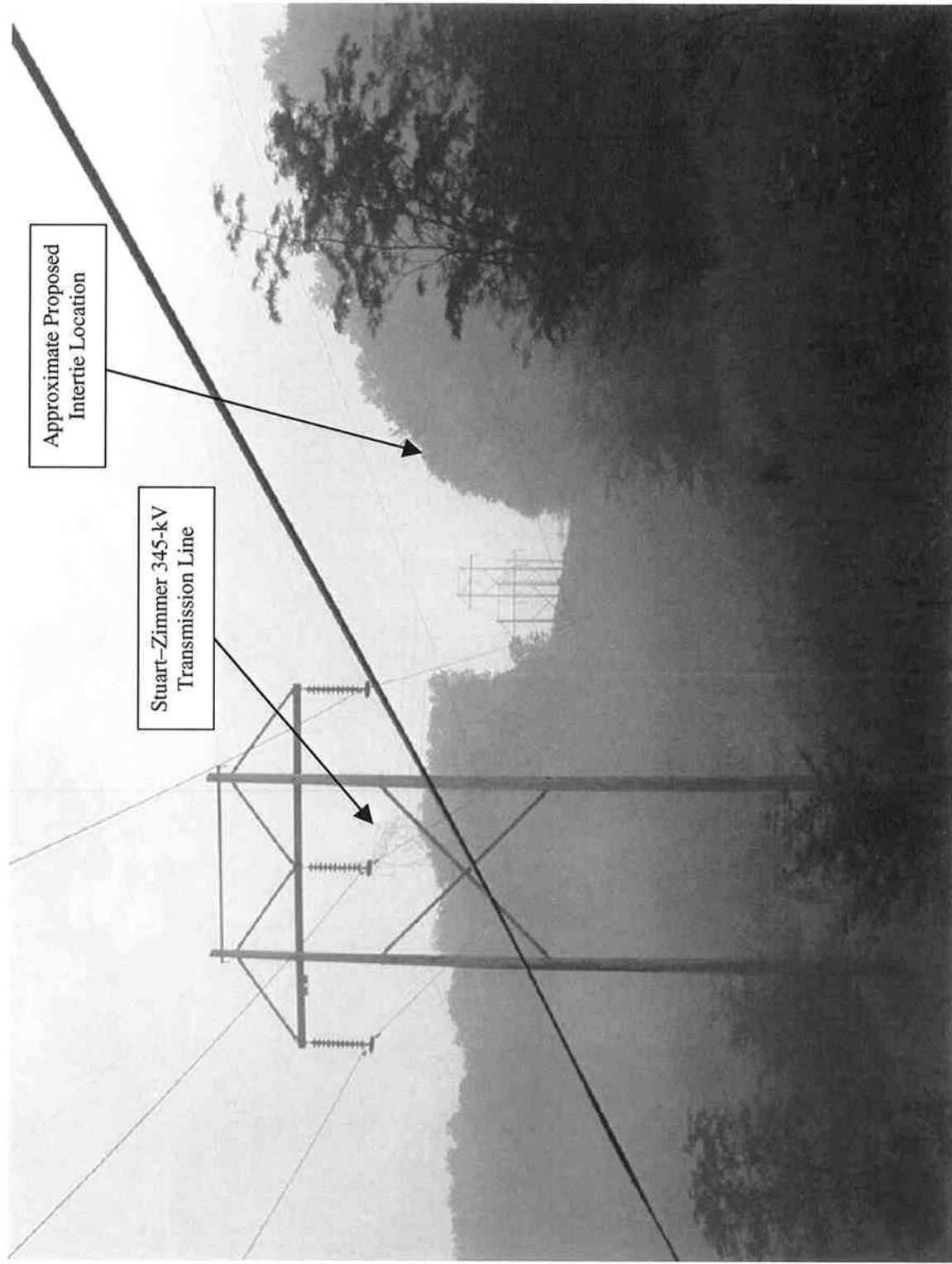


PHOTO 32: On Ohio Side Looking North Down the Kentucky Utilities 138-kV Transmission Line Right-of-Way with the Stuart-Zimmer 345-kV Transmission Line and Proposed Intertie in Background.

APPENDIX B

AGENCY CORRESPONDENCE



TETRA TECH, INC.

October 5, 2001

Mr. Joel LeGris
District Conservationist
Natural Resources Conservation Service
1925 Old Main Street, Suite 2
Maysville, Kentucky 41056

Dear Mr. LeGris:

East Kentucky Power Cooperative (EKPC) has retained Tetra Tech, Inc. to prepare an Environmental Assessment (EA) in support of their obtaining funding from the Rural Utilities Service for a proposed addition of two coal fired electric generating units, associated facilities and interstate power transmission cable.

EKPC proposes to construct and operate the following additions to their facilities at the H. L. Spurlock Power Station located in the United States Geological Service (USGS) Maysville West 7.5 minute quadrangle at the 414 mile mark of the Ohio River near Maysville, Kentucky:

- two 250 megawatt electric power units
- two turbine generators
- two baghouses
- two dry scrubbers
- two selective non-catalytic reduction units
- two 720-foot stacks
- one 345 kilovolt (kV) transmission line

The new transmission will run from the Spurlock Power Station to an existing transmission line that crosses the Ohio River into Brown County, Ohio approximately near the USGS 413 mile mark of the Ohio River. The new transmission line will run parallel to the existing transmission line, cross Scofield Road and tie into an inter-tie of an existing 345 kV transmission line in Brown County. The length of the transmission line in Mason County will be approximately 1¼ mile. All proposed facilities with the exception of the transmission line would be constructed on an area previously disturbed by plant operations.

We are requesting a Prime Farmland Determination for the proposed facilities and transmission line located in Mason County, Kentucky. Enclosed please find a map with the proposed new facilities outlined. We have contacted the Natural Resources Conservation Service office in Brown County, Ohio concerning that portion of the project. If you have any questions or need further information, please call me at (703) 931-9301, ext. 545. Thank you for your assistance.

Sincerely,

Janine Cefalu
Environmental Analyst

**UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE**

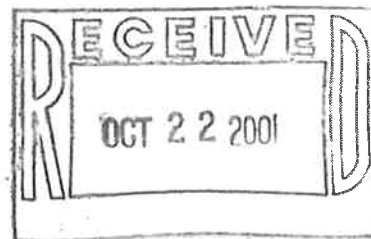
**1925 OLD MAIN STREET, SUITE 2
MAYSVILLE, KENTUCKY 41056**

**Phone: 1-606-759-5570
Fax: 1-606-759-9145**



October 18, 2001

Janine Cefalu
Tetra Tech, Inc.
One Skyline Place
5205 Leesburg Pike, Suite 1400
Falls Church, VA 22041



Dear Ms.Cefalu:

Thank you for the information concerning the possible construction and expansion of the existing power units at the East Kentucky Power Cooperative's Spurlock Power Station in Mason County. I understand that this facility will occupy 1.6 acres plus additional land for the transmission lines. The land under consideration is prime farmland if we were only looking at the soil type, however, since it is now part of an urban built-up area and is developed on two of the four sides, for land use purposes, it is not considered farmland at all.

Since this land area is already developed for non-agricultural purposes, it does not fall into the criteria of farmland use, therefore, it is exempt from the prime farmland designation for environmental evaluation.

If I can be of any further assistance, please contact me at 1-800-873-2915 or at 1-606-759-5570.

Sincerely,

A handwritten signature in cursive script, appearing to read "Joel LeGris".

Joel LeGris
USDA District Conservationist
Mason County, Ky.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).



TETRA TECH, INC.

October 5, 2001

Mr. Ed Campbell
District Conservationist
Natural Resources Conservation Service
706 South Main Street
Georgetown, Ohio 45121


Dear Mr. Campbell:

East Kentucky Power Cooperative (EKPC) has retained Tetra Tech, Inc. to prepare an Environmental Assessment (EA) in support of their obtaining funding from the Rural Utilities Service for a proposed addition of two coal fired electric generating units, associated facilities and interstate power transmission cable.

EKPC proposes to construct and operate the following additions to their facilities at the H. L. Spurlock Power Station located in the United States Geological Service (USGS) Maysville West 7.5 minute quadrangle at the 414 mile mark of the Ohio River near Maysville, Kentucky: two, 250 megawatt electric power units and one 345 kilovolt (kV) transmission line. The new transmission will run from the Spurlock Power Station to an existing transmission line that crosses the Ohio River into Brown County, Ohio approximately near the USGS 413 mile mark of the Ohio River. The new transmission line will run parallel to the existing transmission line, cross Scofield Road and tie into an inter-tie of an existing 345 kV transmission line in Brown County. The length of the transmission line in Brown County will be approximately 2 ¼ miles with a 150-foot wide right-of-way.

We are requesting a Prime Farmland Determination for the proposed transmission line right-of-way located in Brown County, Ohio. Enclosed please find a map with the proposed new facilities outlined. We have contacted the Natural Resources Conservation Service office in Mason County, Kentucky concerning that portion of the project. If you have any questions or need further information, please call me at (703) 931-9301, ext. 545. Thank you for your assistance.

Sincerely,


Janine Cefalu
Environmental Analyst



706 South Main Street, Georgetown, Ohio 45121
(937) 378-4424 Fax (937) 378-6710

October 17, 2001

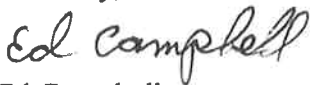
Janine Cefalu
Environmental Analyst
One Skyline Place
5205 Leesburg Pike
Suite 1400
Falls Church, VA 22041

Dear Janine Cefalu:

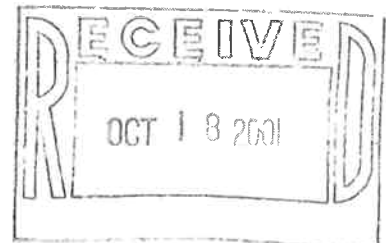
This letter is in regard to your request of October 5, 2001. Enclosed you will find the Farmland Conversion Impact Form, AD 1006.

If you have any questions, please contact our office at, 937-378-4424.

Sincerely,



Ed Campbell
District Conservationist, NRCS



U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I (To be completed by Federal Agency)		Date Of Land Evaluation Request	
Name Of Project		Federal Agency Involved	
Proposed Land Use		County And State	
PART II (To be completed by SCS)		Date Request Received By SCS 10-9-01	
Does the site contain prime, unique, statewide or local important farmland? (If no, the FPPA does not apply - do not complete additional parts of this form).		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Acres Irrigated 0 Average Farm Size 123
Major Crop(s) Grass Tobacco	Farmable Land In Govt. Jurisdiction Acres: 239603 % 76	Amount Of Farmland As Defined In FPPA Acres: 136396 % 43	
Name Of Land Evaluation System Used LE & LESA	Name Of Local Site Assessment System NONE	Date Land Evaluation Returned By SCS 10-10-01	
PART III (To be completed by Federal Agency)		Alternative Site Rating	
		Site A	Site B
A. Total Acres To Be Converted Directly			Site C
B. Total Acres To Be Converted Indirectly			Site D
C. Total Acres In Site			
PART IV (To be completed by SCS) Land Evaluation Information			
A. Total Acres Prime And Unique Farmland		1.06	
B. Total Acres Statewide And Local Important Farmland			
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted		.0000044	
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value		34	
PART V (To be completed by SCS) Land Evaluation Criterion			
Relative Value Of Farmland To Be Converted (Scale of 0 to 100 Points)		73	
PART VI (To be completed by Federal Agency)			
Site Assessment Criteria (These criteria are explained in 7 CFR 658.5(b))	Maximum Points		
1. Area In Nonurban Use			
2. Perimeter In Nonurban Use			
3. Percent Of Site Being Farmed			
4. Protection Provided By State And Local Government			
5. Distance From Urban Builtup Area			
6. Distance To Urban Support Services			
7. Size Of Present Farm Unit Compared To Average			
8. Creation Of Nonfarmable Farmland			
9. Availability Of Farm Support Services			
10. On-Farm Investments			
11. Effects Of Conversion On Farm Support Services			
12. Compatibility With Existing Agricultural Use			
TOTAL SITE ASSESSMENT POINTS	160		
PART VII (To be completed by Federal Agency)			
Relative Value Of Farmland (From Part V)	100		
Total Site Assessment (From Part VI above or a local site assessment)	160		
TOTAL POINTS (Total of above 2 lines)	260		
Selected:		Date Of Selection	
Reason For Selection*		Was A Local Site Assessment Used? Yes <input type="checkbox"/> No <input type="checkbox"/>	



TETRA TECH, INC.

October 8, 2001

Ms. Megan Sullivan
U.S. Fish and Wildlife Service
Reynoldsburg Field Office
6950 Americana Parkway, Suite H
Reynoldsburg, Ohio 43068

Subject: Proposed Power Transmission Line, Brown County, Ohio

Dear Ms. Sullivan:

East Kentucky Power Cooperative (EKPC) has retained Tetra Tech, Inc. to prepare an Environmental Assessment (EA) in support of their obtaining funding from the Rural Utilities Service for a proposed interstate power transmission line and associated facilities.

EKPC proposes to construct and operate the following additions to their facilities at the H. L. Spurlock Power Station located in the United States Geological Service (USGS) Maysville West 7.5 minute quadrangle at the 414 mile mark of the Ohio River near Maysville, Kentucky: two 250 megawatt electric power units and one 345 kilovolt (kV) transmission line. As shown on the attached map, the new transmission line will run from the Spurlock Power Station and then parallel an existing transmission line that crosses the Ohio River into Brown County, Ohio near the USGS 413 mile mark of the Ohio River. The new transmission line will cross Scofield Road and tie into an existing 345 kV transmission line in Brown County.

The length of the transmission line will be approximately 3.5 miles with a 150-foot wide right-of-way. EKPC has committed to performing an ecological survey of the proposed transmission line right-of-way and adjacent areas in the near future. Please let me know if you would like a copy of the report when it is available.

Construction of the transmission line in Ohio should take place sometime between October 2002 and March 2004 and impacts should be limited to the immediate project area. We invite your input on any known ecological resources in the area, potential impacts to them from this project, mitigation measures you may require, and any other concerns you may have. We have contacted the US Fish and Wildlife Service office in Kentucky responsible for Mason County concerning that portion of the project.

If you have any questions, you can reach me at (703) 931-9301 or via email at scott.truesdale@tetratech.com. Thank you.

Sincerely,

F. Scott Truesdale, P.G.
Project Manager

Attachment



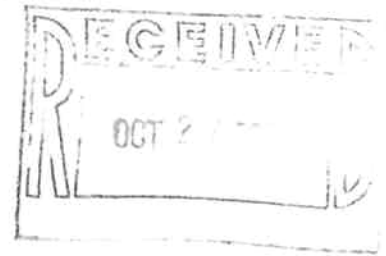
United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
6950 Americana Parkway, Suite H
Reynoldsburg, Ohio 43068-4132

(614) 469-6923
Fax: (614) 469-6919

October 18, 2001



Mr. F. Scott Truesdale
Tetra Tech, Inc.
One Skyline Place
5205 Leesburg Pike, Suite 1400
Falls Church, VA 22041

Dear Mr. Truesdale:

This is in response to your October 8, 2001 letter requesting information we may have regarding the occurrence or possible occurrence of Federally-listed threatened or endangered species within the vicinity of the proposed site. The project involves the installation of a 345 kilovolt transmission line that runs from the Spurlock Power Station in Maysville, Kentucky, across the Ohio River to an existing line near Scofield Road in Brown County, Ohio. The length of the line is approximately 3.5 miles with a 150-foot right-of-way. There are no Federal wildlife refuges, wilderness areas, or critical habitat within the vicinity of this project.

ENDANGERED SPECIES COMMENTS: The proposed project lies within the range of the Indiana bat, a Federally listed endangered species. Summer habitat requirements for the species are not well defined but the following are thought to be of importance:

1. Dead trees and snags (especially those with exfoliating bark) which may be used as maternity roost areas along riparian corridors.
2. Live trees (such as shagbark hickory) which have exfoliating bark.
3. Stream corridors, riparian areas, and nearby woodlots which provide forage sites.

Considering the above items, we recommend that if trees with exfoliating bark (which could be potential roost trees) are encountered on the proposed site, they should be saved wherever possible. If they must be cut, they should not be cut between April 15 and September 15.

If desirable trees are present and if the above time restriction is unacceptable, mist net or other surveys should be conducted to determine if bats are present. The survey should be designed and conducted in coordination with the endangered species coordinator for this office. The survey should be conducted in June or July since the bats would only be expected in the project area from approximately April 15 to September 15.

This technical assistance letter is submitted in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C.661 et seq.), the Endangered Species Act of 1973, as amended, and is consistent with the intent of the National Environmental Policy Act of 1969, and the U.S. Fish and Wildlife Service's Mitigation Policy.

If you have questions, or if we may be of further assistance in this matter, please contact Megan Sullivan at extension 16 in this office.

Sincerely,

Kenneth C. Lammers
Acting Supervisor

cc: DOW, Wildlife Environmental Section, Columbus, OH



TETRA TECH, INC.

November 1, 2001

Mr. Jim Widlak
U.S. Fish and Wildlife Service
446 Neal Street
Cookville, TN 38501

Subject: Proposed Construction of Two Coal-Fired Units, Associated Facilities and a Transmission Line in
Mason County, Kentucky

Dear Mr. Widlak:

East Kentucky Power Cooperative (EKPC) has retained Tetra Tech, Inc. to prepare an Environmental Assessment (EA) in support of their obtaining funding from the Rural Utilities Service for a proposed addition of two coal-fired electric generating units and associated facilities at the Spurlock Station. An interstate power transmission cable is also proposed.

Specifically, construction and operation of the following equipment is proposed:

- two 268 megawatt electric power units
- two turbine generators
- two baghouses
- two SO₂ Removal Units
- two selective non-catalytic reduction units
- two 720-foot stacks
- one 345 kilovolt (kV) transmission line

As shown on the attached map, the new transmission will run from the Spurlock Power Station to an existing transmission line that crosses the Ohio River into Brown County, Ohio approximately near the United States Geological Survey 413 mile mark of the Ohio River. The new transmission line will run parallel to the existing transmission line, cross Scofield Road and tie into an inter-tie of an existing 345 kV transmission line in Brown County. The length of the transmission line in Mason County will be approximately 1¼ mile. All proposed facilities with the exception of the transmission line would be constructed on areas previously disturbed by plant operations.

Construction of the two additional coal-fired electric generating units and associated facilities should take place sometime between May 2003 and March 2004. Construction of the transmission line in Kentucky should take place sometime between October 2002 and March 2004 and impacts should be limited to the immediate project area. We invite your input on any known ecological resources in the area, potential impacts to them from this project, mitigation measures you may require, and any other concerns you may have. We have contacted the US Fish and Wildlife Service office in Ohio responsible for Brown County concerning that portion of the project.

If you have any questions, you can reach me at (703) 931-9301 or via email at scott.truesdale@tetratech.com.
Thank you.

Sincerely,

F. Scott Truesdale, P.G.
Project Manager

Attachment



EAST KENTUCKY POWER COOPERATIVE

Mr. Charles Hockensmith
Kentucky Heritage Council
300 Washington Street
Frankfort, Kentucky 40601

July 17, 2001

Dear Charles;

Attached is a site map of the proposed EA Gilbert Power Station located adjacent to the existing Charleston Bottoms Power Station in rural Mason County, Kentucky. The area being proposed has had extensive site development and disturbance. The site has been graded and used as construction lay down to construct previous units. The plow zone has been extensively altered. We have had a request to begin driving support pylons at the site in March of 2002. I would propose that an archaeological survey will not be necessary at this site but I needed your comments.

As with all of our construction projects, we would notify your office immediately if there are any cultural artifacts uncovered during construction. Thank you for taking the time to comment. You can contact me at 800-238-3443 (361) if you have any comments.

Sincerely,

Jeff Hohnman
Manager of Natural Resources
and Environmental Communications



Education, Arts and Humanities Cabinet

KENTUCKY HERITAGE COUNCIL

The State Historic Preservation Office

Paul E. Patton

Governor

Marlene M. Helm

Cabinet Secretary

David L. Morgan
Executive Director and
SHPO

July 31, 2001

Mr. Jeff Hohman
Manager of Natural Resources
and Environmental Communications
East Kentucky Power
4775 Lexington Road
Winchester, KY 40391

Dear Mr. Hohman:

Thank you for your faxed letter of July 17, 2001 concerning East Kentucky Power Cooperative's proposed E. A. Gilbert Power Station III project in Mason County, Kentucky. The project consist of adding another generating unit at the existing plant site. A review of our records indicates that no properties currently listed in the National Register of Historic Places will be affected by the proposed project. The photographs of the project area (dropped by our office on July 30, 2001) clearly show that the surface area has been disturbed by prior site development. We have no objection to East Kentucky Power Cooperative driving the support pylons. However, since the project area is near the Ohio River, there is potential for buried archaeological remains below the disturbed zone. Since no archaeological investigations were done prior the original power plant construction, we don't know what cultural resources may be present. To avoid any problems during construction, I recommend that East Kentucky Power Cooperative hire a professional archaeologist to conduct deep backhoe testing to determine if buried archaeological sites eligible for listing in the National Register of Historic Places are present. The archaeological report must be submitted for my review, comment, and approval. In the future, we would like to review any proposed transmission line routes associated with the project.

Should you have any questions, feel free to contact Charles Hockensmith of my staff at (502) 564-7005.

Sincerely,

David L. Morgan, Director
Kentucky Heritage Council and
State Historic Preservation Officer



Education, Arts and Humanities Cabinet

KENTUCKY HERITAGE COUNCIL

The State Historic Preservation Office

Paul E. Patton
Governor
Marlene M. Helm
Cabinet Secretary

David L. Morgan
Executive Director and
SHPO

December 20, 2001

Mr. Jeff Hohman
Manager of Natural Resources
and Environmental Communications
East Kentucky Power
4758 Lexington Road
Winchester, KY 40391

Dear Mr. Hohman:

The State Historic Preservation Office has received for review and approval an archaeological report entitled "Phase I Investigations of East Kentucky Power Cooperative's Proposed Power Generating Unit 3, Mason County, Kentucky" by Christy Wood Pritchard and John W. Picklesimer II.

The survey found no evidence of prehistoric or early historic occupation in the project area. I concur with the authors' findings. In accordance with 36CFR Part 800.4(d) of the Advisory Council's revised regulations our finding is that there are No Historic Properties Present within the undertaking's area of potential impact. Therefore, we have no further comments and the Agency Official's responsibility to consult with the Kentucky State Historic Preservation Officer under the Section 106 review process is fulfilled.

Should you have any questions, feel free to contact Charles Hockensmith of my staff at (502) 564-7005.

Sincerely,

A handwritten signature in cursive script that reads "David L. Morgan".

David L. Morgan, Director
Kentucky Heritage Council and
State Historic Preservation Officer

cc: Mr. John W. Picklesimer II

300 Washington Street
Frankfort, Kentucky 40601
An equal opportunity employer M/F/D



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FAX (502) 564-5820
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